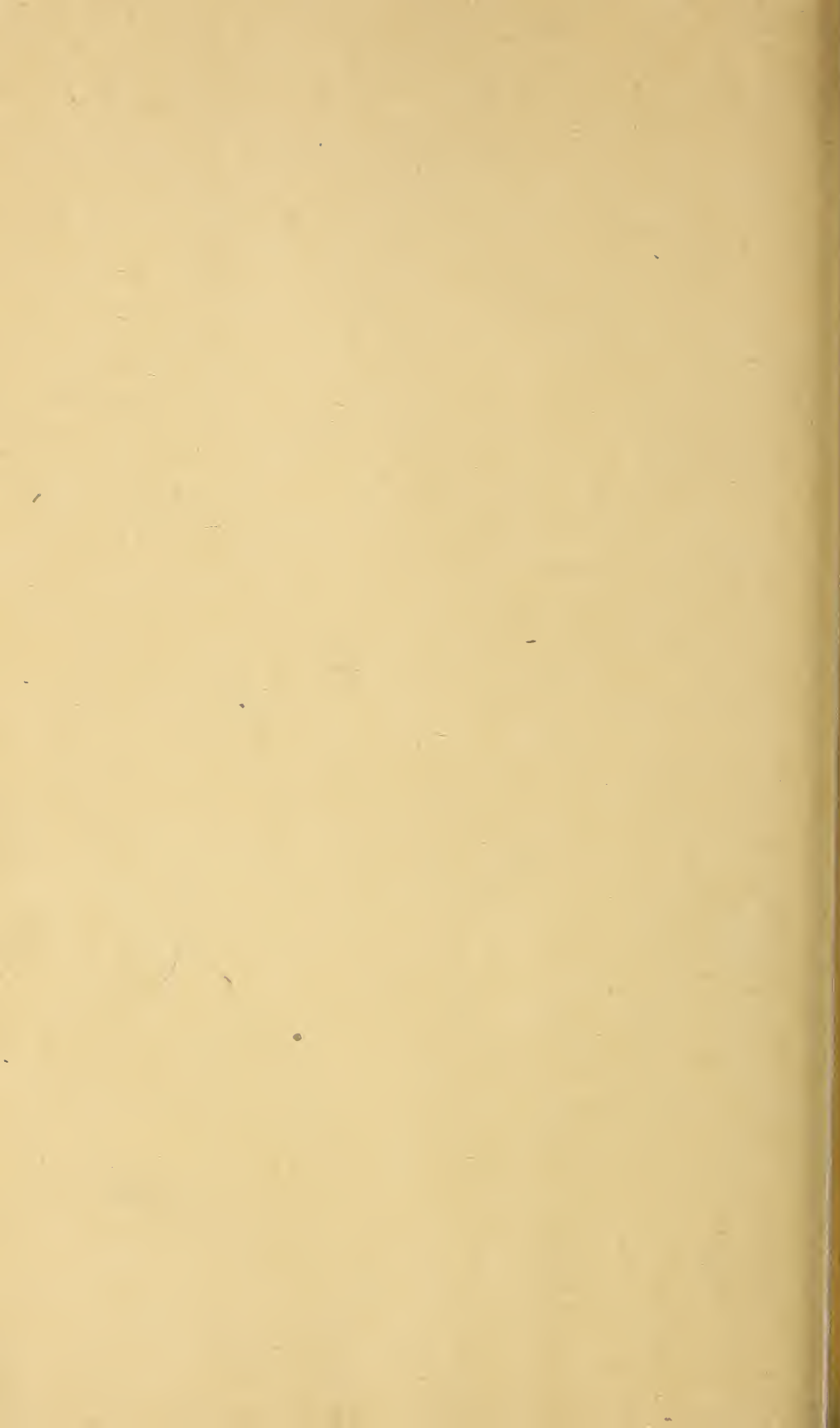


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84M  
Page 2

UNITED STATES DEPARTMENT OF AGRICULTURE  
BUREAU OF AGRICULTURAL ECONOMICS

# Inventory of MAJOR LAND USES

## UNITED STATES

### MAJOR USES OF LAND, 1945

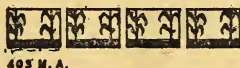
PASTURE AND  
GRAZING .....  
(NONFORESTED)



FOREST LAND ...  
(GRAZED AND NOT GRAZED)



CROPLAND .....



SPECIAL USE AREAS  
(PARKS, RAILROADS, HIGHWAYS,  
MILITARY LANDS, FARMSTEADS,  
CITIES, TOWNS, ETC.)



Each symbol represents  
100 million acres

RURAL LAND OF  
LITTLE FARMING USE  
(DESERT, ROCK, SWAMPS, ETC.)



TOTAL LAND AREA  
1,905 MILLION ACRES

NEG. 46367M

WASHINGTON, D. C.  
MISCELLANEOUS PUBLICATION No. 663

## EXPLANATION

At all times many people are interested in the use of land and the way in which the land is divided among agricultural uses. In response to this interest, the Bureau of Agricultural Economics has compiled and published occasionally over the last 25 years, figures that show the acreages used for crops, the pasture and grazing areas, forests and woodlands, and other major land areas. This report follows generally these past inventories as to scope and in the procedure for the assembly of data.

Gradually, however, there has been accumulation of data on land use and ownership for a longer period, thus making possible more complete information on trends than heretofore available. Coverage also is more complete by States and regions than formerly, owing to improvements in mapping by aerial photography and in statistical and other surveys of agriculture, land use and conditions affecting use.

The purpose of the present publication is to supply an account of the extent and distribution of the major agricultural land uses and a general analysis of the land use situation in the United States, showing the latest data available for both land in farms and land outside farms. The information on the acreages of land devoted to the chief purposes provides a comprehensive picture of the use of all land in the United States, trends in land use, and elements affecting use.

Among the chief sources of land use data are reports and records of the following: Bureau of the Census, Department of Commerce; Bureau of Land Management, Department of the Interior; the Forest Service, Soil Conservation Service, Bureau of Plant Industry, Soils and Agricultural Engineering, Field Service Branch of the Production and Marketing Administration, and the Bureau of Agricultural Economics, all of the Department of Agriculture; as well as reports and records of many State and other agencies.

Special acknowledgment is made to the Land Economics Research Committee, which met in Washington in December 1946, and to numerous other people who made suggestions or who furnished needed information.



# Inventory of Major Land Uses in the United States

By L. A. REUSS, H. H. WOOTEN, and F. J. MARSCHNER

*Agricultural Economists*

*Bureau of Agricultural Economics*

## CONTENTS

	Page		Page
Introduction.....	1	Trends in land use—Continued	
The land and its use.....	3	Land unsuited to cultivation.....	57
Physical factors affecting use.....	3	Local and district measures to assure good land use.....	57
Agricultural production and land use.....	5	Other land use measures.....	61
Explanation of land-use classes.....	8	Present condition of the agricultural land.....	61
Principal uses of cropland.....	9	Soil erosion and fertility situation.....	61
Land available for crops.....	12	Pasture and range situation.....	63
Pasture and range land.....	14	Forest-resource situation.....	65
Forest land.....	17	Expected trends in land utilization.....	66
Special use areas.....	19	General stability of total acreage used for crops.....	67
Miscellaneous other land.....	21	Pasture and range land.....	69
Land in farms and not in farms.....	22	Forest land.....	69
Trends in land use.....	26	Special-use areas.....	70
Early land use.....	26	Land having slight agricultural value.....	70
Land use, 1880-1945.....	29	Future land use measures.....	70
Land use, by ownership classes, 1920-45.....	34	Literature cited.....	71
Land development and improvement.....	37	Appendix.....	74
Sources of additional cropland.....	54		

## INTRODUCTION

The land area of the continental United States is about 1,905 million acres. Many kinds of land are included. To suggest the variety we have only to mention the dark, fertile cornlands in the Midwest; the cotton, tobacco, rice, sugarcane, and timberlands in the South; the snow-capped mountains, irrigated valleys, the subhumid range, and the desert lands of the West; the dairy lands and the timberlands of the Lake States and Northeast; the areas of the industrial centers, great cities, seaports, villages, and rural home sites throughout the Nation.

In this wide and dramatic sweep of the continent there is the utmost variation in climate, soil, slope of the surface, and development and use of the land.

Historically, the over-all pattern of land utilization has changed as physical, economic, and social conditions have changed. While the country was being settled, land was plentiful, population was increasing, and demand for agricultural products was generally expanding. Forest lands were cleared for the raising of crops and pasturing of

livestock. As settlement moved westward, native grasslands were plowed up and land was brought into cultivation by irrigation and drainage.

Although active homesteading continued until recent times, by 1900 most of the land was in use for grazing or other purposes and the period of abundant new land had ended. From as early as 1850, farmers have moved from certain areas in the eastern part of the South, the Middle Atlantic, and New England States, usually taking a westward course. In some areas, especially since 1880, there has been noticeable reversion of low-yielding cropland to grazing uses or to forests. The several causes have included plentiful off-farm employment bringing higher incomes than farming, availability of better land elsewhere, soil erosion, and loss of fertility. An increasing awareness that rapid and unrestrained development had led to depletion of timber and grazing resources, wasting of soil by erosion, uncontrolled run-off of water, lowered water tables, floods, and loss of watershed, recreational and wildlife values has led to legislation providing for reservations for public forests, parks, grazing, and wildlife areas.

The period between World War I and World War II was in general an unsettled period, with widespread changes in land use. This was especially true during the 1930's. Immediately following World War I, there was great expansion in the cropland area by drainage, clearing, irrigation, and plowing up grassland. Much of the remaining public land was homesteaded during these years. But from 1930 to 1940, there was contraction in cropland. There were immense shifts in acreages of certain crops, as from cotton and wheat to hay, pastures, soybeans, and truck crops. Much poor cropland was abandoned for field crops and was either restored to grass and forest or allowed to revert naturally to its original use. Next came World War II, which again brought changes and more intensive utilization of the land.

The land produced a record-breaking quantity of food and feed crops during World War II. At the same time, the rural land area was subjected to demands for space for military, residential, and industrial sites. Notable among the shifts in land use during World War II was the increase in the acreage of harvested crops and the decrease in the area of idle and fallow land. Several million acres of pasture and range land were plowed for crops. In the West, some of this land had not been broken since World War I, and some that had always been considered too dry had never been plowed. Some drainage and irrigation improvements were made, although these were limited by scarcities of labor, material, and equipment. In the good land areas most shifts were toward more intensive use but in some parts of the Eastern and Southern States, especially in the poorer agricultural areas, farmers and farm workers sought more profitable employment in war industries. Often, in the latter instance, cropland was converted to grazing or allowed to grow up to weeds, pasture land reverted to brush and woodland, and hilly, eroded farms were abandoned. In nearly all parts of the country the expanding land requirements for military, industrial, and residential uses reduced slightly the acreages available for agricultural use.

The efficient use of the Nation's land resource is a subject of primary importance. Periodic inventories of land use serve as sources of statistical information concerning land use and trends in use, aid

in the evaluation of national land requirements, and serve to throw into relief facts on regional distribution of resources. The present land use report may be considered as an initial step toward the objective of a more complete inventory of land use and land productivity than has ever been had before.

Estimates of the extent of the various uses of land in the continental United States in 1945 are based on the Census of Agriculture, published and unpublished statistics of State and Federal agencies, and available maps. Limitations of source material are recognized at the outset. Definitions of land use classes and procedures have varied somewhat from period to period, owing to changes in ways of reporting by the Census of Agriculture and other agricultural surveys conducted by Federal and State agencies. After all, these are the chief sources of over-all statistics on agricultural land use.

Effort has been made to reconcile any major differences in existing classifications of land. Such differences often arise because some of the land is used for two purposes simultaneously and because the dividing line is not everywhere clear-cut between certain types of use. In the West, grazing lands having vegetative covers of desert shrub, piñon-juniper, and chaparral are sometimes classed as nonforested grazing land and sometimes as arid woodland grazed. There is considerable justification for this classification. Classifications of nonforested grazing land and desert land vary from time to time because in periods of favorable rainfall, grazing tends to expand into areas that are usually too dry. Further expansion and progress in land inventory and classification work will be necessary before all of these differences can be eliminated.

Physical features—land relief, climate, soils, and natural vegetation—are influential in present and potential land utilization and are briefly considered later, along with major uses of land. Considered also are the trends in land use, ownership, land development and improvement, and land abandonment; the present situation with regard to soil erosion and fertility and forage and timber depletion; and expected trends in land utilization.

## THE LAND AND ITS USE

### PHYSICAL FACTORS AFFECTING USE

Agricultural uses of the land in the United States are principally three—pasture, crops, and forest. Sometimes these three uses are competitive; for example, where climate, topography, and soil are favorable, farmers may use land for crops, for pasture, or for timber production, with the most profitable use usually predominating. Often land uses are dual or multiple, as when forest land is used simultaneously for timber production and for grazing, and sometimes, in addition, as a source of water for domestic use, power, and irrigation. Sometimes only one use is feasible, as in the arid or semi-arid areas where the climate is not favorable for growing field crops without irrigation or for growing trees, but where the land usually may be grazed during some part of the year.

Degree and direction of slope and elevation are important from the standpoint of climate, soil development, drainage, and erosion; and



all of these factors singly and combined influence decidedly the use of land and its production. The plains and prairies of the central region of the United States, which in general is the region of lower elevation and smoother relief, contains much of the land that has agricultural productivity ratings of excellent, good, or fair. Much

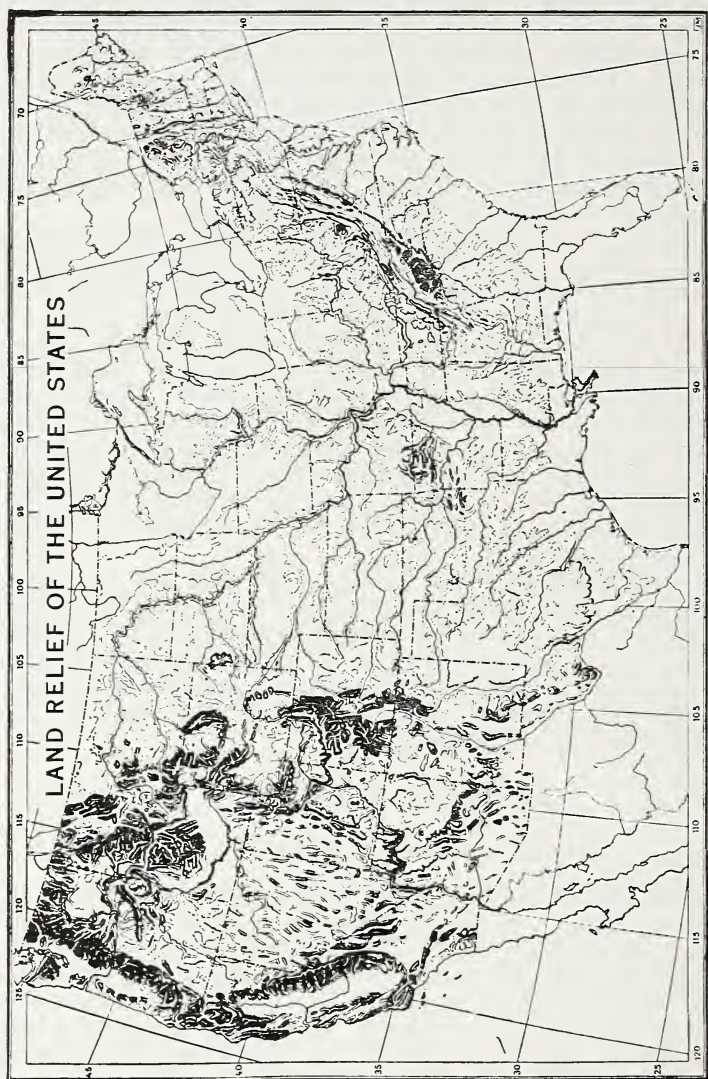


FIGURE 1.—In a generalized way this map shows the relief of the United States and its division into high mountainous grazing and forest regions and lower, smoother farming regions. The generally mountainous character of the West, beginning near the 5,000-foot elevation line, is clearly shown; the high altitude of much of the West, particularly in the grazing and forest regions, and the lower elevations of the central and eastern farming and forest regions are not so clearly indicated. Owing to altitude, much of the West has a cooler climate than corresponding latitudes in the East. The vastness of the Mississippi Valley, with its level-to-rolling surface, except for the Ozark uplift, is contrasted with its rugged boundaries.

of the land that is essentially incapable of tillage is in the western areas, where elevations are high, slopes are steep, growing seasons are short, and precipitation is low (fig. 1).

The country can be divided agriculturally into two main parts—the East and the West—on the basis of the physical factors and prevalent use of the land, whether for crops or for pastures. The dividing line approximates longitude  $100^{\circ}$  and the 20-inch-and-above precipitation zone, except that it trends southeasterly in Texas and north-

westerly in North Dakota. The East has mostly a humid or sub-humid climate; the West has an arid or semiarid climate, except in the North Pacific region, parts of the Columbia Plateau, and at the higher altitudes in the mountains. The East is divided also into regions on the basis of the dominance of a kind of farming, which is mostly the result of latitude and temperature conditions. The West is divided into regions on the basis of the use of the land for grazing or crops, which is determined largely by altitude and rainfall.

It is estimated that about 10 percent of the land in the United States lies at an elevation of 6,000 feet or more above sea level, about 33 percent is located at elevations of 2,000 to 5,999 feet, and the remaining 57 percent has an elevation of less than 2,000 feet.

As the elevation increases temperatures tend to be lower and growing seasons to be shorter in all regions. For nearly all of the land located above 6,000 feet, the frost-free season is reduced to an average of about 90 days or less; only in the Southwestern States is it somewhat longer. Most of the land above 6,000 feet is rugged and mountainous, suitable mainly to grazing and timber production. Some land in intermountain basins is more level but is adapted chiefly to grazing. Such high land used for the more hardy crops is confined to the most favorable locations and the total is comparatively small.

In the Great Plains and Mountain States, the average annual precipitation decreases from about 35 inches in the Eastern Plains to less than 10 inches in the West, and makes all of the transition from a humid to an arid climate. The amount and distribution of precipitation and the range and distribution of temperatures are very influential in plant growth and use of the land.

The area having average annual precipitation of less than 20 inches is estimated at about 740 million acres. This area is arid to sub-humid, depending on temperature and evaporation. Irrigation is necessary for farming in the more arid areas. With precipitation near the upper limits of this class, dry-land farming is practiced, but the drought hazard generally is great and summer fallowing of land is common. Here, latitude, elevation, and wind velocities create marked regional and local differences in productivity. About 40 percent of the land in the United States is markedly deficient in precipitation (27). Additional areas, located in both the West and the East, are subject to drought of lesser intensity and frequency.

The weather and other natural factors have been especially favorable to farming and grazing over vast areas during the last few years, especially from 1943 to 1947. Not only have acreages of outright crop failure been low, but yields per acre have been especially good. Part of this is attributed to the prevailing conditions of rainfall and temperature.

#### AGRICULTURAL PRODUCTION AND LAND USE

From the standpoint of volume and value, the agricultural production of our land in recent years has been enormous and has included record-breaking quantities of many crops. In 1946, for example, production included such totals as 3.2 billion bushels of corn, 1.2 billion bushels of wheat, 1.5 billion bushels of oats, 200 million bushels of soybeans, 480 million bushels of potatoes, and 2.3 billion pounds of tobacco. Numerous other crops reached high to record-breaking figures.

TABLE 1.—*Major uses of land, United States, 1945*

Land use	Acreage	Percentage of total
	<i>Million acres</i>	<i>Percent</i>
Crops and pasture:		
Cropland <sup>1</sup> .....	403	21. 2
Pasture and nonforested grazing land <sup>2</sup> .....	707	37. 1
Total.....	1, 110	58. 3
Forest:		
Grazed.....	345	18. 1
Not grazed <sup>3</sup> .....	257	13. 5
Total.....	602	31. 6
Special use <sup>4</sup> .....	100	5. 2
Miscellaneous <sup>5</sup> .....	93	4. 9
Grand total <sup>6</sup> .....	1, 905	100. 0
Agriculture:		
Land in farms.....	1, 142	59. 9
Nonfarm pasture and grazing land <sup>7</sup> .....	428	22. 5
Total.....	1, 570	82. 4
Nonfarm forest land not grazed.....	186	9. 8
Special land-use areas and miscellaneous.....	1, 756	92. 1
Grand total <sup>6</sup> .....	149	7. 8
	1, 905	100. 0

<sup>1</sup> The 403 million acres include cropland harvested, crop failure, and cropland idle or fallow. If the 48 million acres of rotation pasture, or cropland used for pasture, are included, 451 million acres would be classified as cropland. For purposes of this report, however, it was desired to show the acreages actually used for crops, pasture, etc., and not the acreages suitable for these uses.

<sup>2</sup> Pasture and nonforested grassland grazed. Includes 48 million acres of rotation pasture, or cropland used for pasture.

<sup>3</sup> Exclusive of 22 million acres of forest land in parks, preserves, recreation, and other uses.

<sup>4</sup> Urban areas, highways and roads, railroads, airports, parks, game refuges, military reservations, farmsteads, farm roads and lanes.

<sup>5</sup> Desert, rock, sand dunes, etc. Land generally having low agricultural value.

<sup>6</sup> Individual items adjusted to total.

<sup>7</sup> Includes nonfarm forest land grazed.

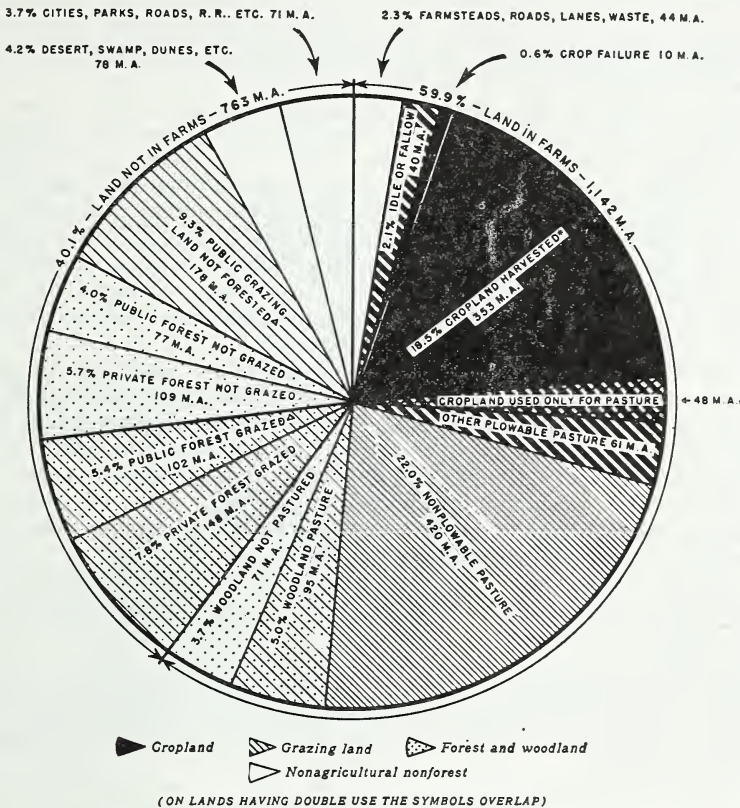
This enormous crop production is grown on only about 21 percent of the land area of the United States. In 1945, cropland amounted to about 403 million acres (cropland harvested, crop failure, and cropland idle or fallow) (table 1 and fig. 2).<sup>1</sup> Mechanization, increased use of fertilizer and lime, adoption of improved crop varieties (such

<sup>1</sup> Census of Agriculture, 1945 (34). Refers to 1944 cropping season.



# MAJOR USES OF LAND IN THE UNITED STATES

1945



PERCENTAGES SHOWN IN LARGE CIRCLE ARE OF TOTAL LAND AREA OF THE NATION

M. A. = MILLION ACRES

\* CROPLAND ACRES ARE FOR 1944

▲ ADDITIONAL PUBLIC GRAZING AND FOREST LANDS ARE INCLUDED IN THE LAND REPORTED IN FARMS

BAE 43236

FIGURE 2.—Of the total land area, more than one-fifth was classified as cropland harvested, failure, fallow and idle in 1945 (exclusive of cropland used for pasture). Altogether, more than half of the land area of the Nation was utilized for pasture or range for livestock. Nearly one-third of the land was forest and woodland. The land required for cities, parks, roads, railroads, farmsteads, and similar uses, and wasteland was about one-tenth of the area.

as hybrid corn), the concentration of cropping onto the better farms and better fields, and favorable weather, have all helped in achieving the present high level of crop production on a cropland acreage that has remained relatively stable for several decades.

In contrast, the area used for pasture and grazing is by far the largest single item of land use and involves about 1,052 million acres, or 55 percent of the land. Included are 707 million acres of non-forested pasture and grazing land and 345 million acres of grazed forest land. Thus, there are 2.6 acres of pasture and grazing land for each acre of cropland. In general, the productivity per acre of pasture and grazing land for crops is much lower than that of cropland now in use and large areas are grazed as the only feasible use; however, in total, it is a noteworthy element of the total agricultural industry and supplies more than one-third of the feed for all livestock.

In 1945, 1,142 million acres were reported in farms by the Agricultural Census. Of this, 529 million acres were open pasture; 403 million acres, cropland; woodland, 166 million acres; and other land, such as farmsteads, roads, and odd spots, 44 million acres. In addition to the land in farms used for agriculture, 178 million acres of open or nonforested pasture and 250 million acres of forest land were grazed outside the farms. In all, approximately 1,570 million acres are used in agricultural production.

"Land used for agriculture"—as measured by the area in farms plus nonfarm pasture and range land—is more than 82 percent of the land area in the country. If timber production on ungrazed forest land outside farms is included as agricultural production, the combined uses—farm land, plus nonfarm pasture and timberland—occupy 1,756 million acres, or about 92 percent of the land area, of which 1,712 million acres are devoted to crops, pasture, and timber, and the remainder is miscellaneous other land in farms.

The rest of the land, 149 million acres, is not used for agriculture or forestry. Included are 15 million acres of high-value urban land and 56 million acres in parks, game refuges, highways, railroads, military reservations, and similar special-use areas outside farms. Included also are 78 million acres located outside farms; they are principally desert, rock, high mountain peak, sand dune, and similar lands having low surface-use value for agriculture, except for wildlife, recreation, or watersheds.

#### EXPLANATION OF LAND-USE CLASSES

For purposes of this report it was desired to show the acreages actually used for crops, the idle or fallow cropland, the land used for pasture, and for forests and other purposes. Accordingly, cropland harvested, land with crop failure, and idle or fallow cropland were grouped together as cropland; while cropland used for pasture was included with the other pasture or nonforested pasture acreage in order to obtain the acreage of the total improved land used for pasture.

The idle or fallow cropland and the cropland used for pasture is usually considered in the crop-rotation system as land that is used for crops but not necessarily every year. The fallow land often is cultivated to conserve moisture and kill weeds in preparation for crops. Much of the idle land also is left unplanted only for a year or two,

but some of it is the poorer cropland representing abandonment for crop purposes.

The land-use classes and terms used in describing crop and pasture land are not always consistent between various reporting agencies or in users of land-use data. For this reason this explanation is necessary to define the terms as used in this report. Whenever other terms are used, or used in another sense, attention is called to these differences.

#### PRINCIPAL USES OF CROPLAND

Cropland harvested, land with crop failures, and cropland idle or fallow, as reported by the Bureau of the Census, are included here as

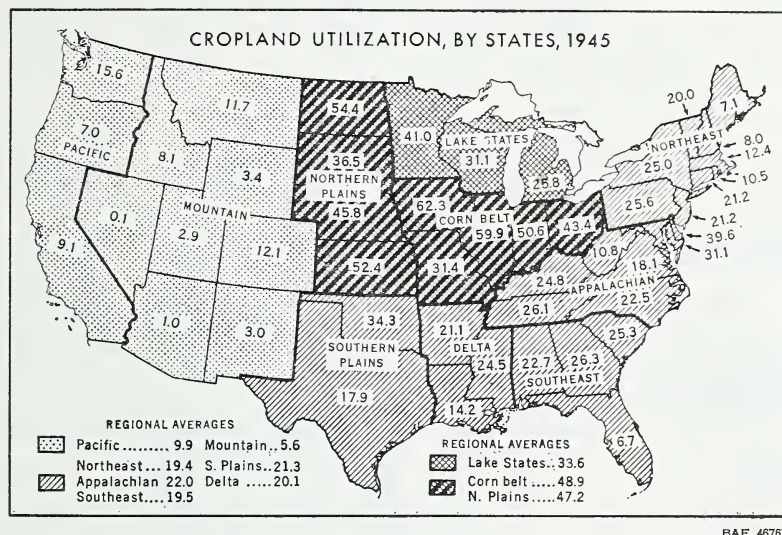


FIGURE 3.—Less than one-quarter of the total land area of the United States was reported as cropland in farms in 1945. About 63 percent was concentrated within 37 percent of the land area comprised by the North Central States, Oklahoma, and Texas. The Western States occupied two-fifths of the area but contained only one-eighth of the cropland. Texas, with the largest acreage of cropland, had less than one-fifth of its total area in this category. Iowa, the fourth State in cropland, had more than three-fifths of its total area in cropland. More than half the total in the five States of Iowa, Illinois, Indiana, North Dakota, and Kansas was cropland.

cropland. In 1945, 403 million acres were so used, of which 88 percent was cropland harvested in 1944, 2 percent represented crop failure, and 10 percent was cropland idle or fallow.

Some classifications of cropland for 1945 also include rotation pasture, or the 48 million acres of cropland that was used only for pasture, or the pasture land that was plowed within the last 7 years. This land acreage, however, has been included in this report with pasture land as it was in that use in 1945.

The larger acreages of cropland are in the Northern Plains and the Corn Belt States. (See fig. 1 for the general agricultural regions and fig. 3 for regional boundaries and designations by States.) The four



States of the Northern Plains contain 23 percent and the five States of the Corn Belt contain 20 percent, or a nine-State total of 43 percent of all cropland (table 2). These States are located in the Great Central Plains, where the land is comparatively level, the soils are productive, and the climate is usually favorable for crops.

TABLE 2.—*Land used for crops, idle or fallow, United States, 1945*<sup>1</sup>

Region <sup>2</sup>	Total		Cropland harvested		Crop failure		Cropland idle or fallow	
	Acreage	Percentage of total <sup>3</sup>	Acreage	Percentage of total <sup>3</sup>	Acreage	Percentage of total <sup>3</sup>	Acreage	Percentage of total <sup>3</sup>
United States...	<i>Million acres</i> 403	<i>Per-cent</i> 100. 0	<i>Million acres</i> 353	<i>Per-cent</i> 100. 0	<i>Million acres</i> 10	<i>Per-cent</i> 100. 0	<i>Million acres</i> 40	<i>Per-cent</i> 100. 0
Great Plains:								
Northern Plains.....	92	22. 9	80	22. 6	4	37. 4	8	21. 6
Southern Plains.....	45	11. 3	41	11. 8	1	10. 3	3	7. 1
Total.....	137	34. 2	121	34. 4	5	47. 7	11	28. 7
Corn Belt.....	81	20. 1	77	21. 7	1	14. 3	3	7. 2
Northeast and Lake.....	62	15. 2	56	15. 9	2	17. 5	4	9. 3
Appalachian and Southeastern.....	54	13. 3	45	12. 7	1	4. 6	8	21. 0
Western:								
Pacific.....	31	7. 7	23	6. 5	( <sup>4</sup> )	1. 6	7	17. 5
Mountain.....	20	4. 9	15	4. 3	1	11. 0	5	12. 4
Total.....	51	12. 6	38	10. 8	1	12. 6	12	27. 9
Mississippi Delta.....	18	4. 6	16	4. 5	( <sup>4</sup> )	3. 3	2	5. 9

<sup>1</sup> U. S. CENSUS OF AGRICULTURE, 1945 (84). Individual items adjusted to total.

<sup>2</sup> Regions by groups of States given in fig. 3. Number of States included in each region is given in parenthesis following the name of region.

<sup>3</sup> Percentages were computed from unrounded data.

<sup>4</sup> Less than 500,000 acres.

Although the largest acreage is located in the Northern Plains, the concentration of cropland is slightly greater in the Corn Belt; about 50 percent of the land there is cropland. Soil erosion and steepness of slope limit the cropland in the Corn Belt along its southern fringe—the southern parts of Missouri, Illinois, Indiana, and Ohio. In the western part of the Northern Plains States there is the additional limitation of low and irregular rainfall. But these two regions are among the major crop-producing areas of the world. In the other regions of this country (classified by States), cropland as a percentage of total land area ranges from 34 percent in the Lake

States to 6 percent in the Mountain States, with the Northeast, Appalachian, Southeast, Southern Plains, and Mississippi Delta States all having from 19.4 to 22.0 percent of their area in cropland (fig. 3).

In 1947, land planted in crops (cropland harvested plus crop failure) is estimated as approximately 367 million acres, including wild hay and orchards but excluding fallow land and rotation pasture. This total is slightly larger than in any of the preceding 3 years and about 4 million acres more than the 363 million acres in 1944 reported by the Census of Agriculture. From 1944 to 1947, the total acreages of land planted or grown in crops changed noticeably among the principal crops and by geographical regions. Wheat acreage increased greatly. Much of this increase was in the Great Plains and other Western States. Increased planting in the West came from seeding land that formerly would have been summer fallowed and from plowing up grassland. Corn acreage decreased materially in the Corn Belt, with some increases in small grain, hay, and pasture. Cotton acreage increased 2 million acres. Increased acreages were also used for fruit and truck crops. Some of the additional acreage planted in crops resulted from newly developed irrigated, drained, and cleared land.

Besides the 367 million acres actually planted in crops, there were approximately 18 million acres being fallowed in preparation for small-grain crops and 22 million acres lying idle, making a total of 407 million acres of cropland in 1947, exclusive of rotation pasture. It is estimated that about 12 million acres or more of the cropland were double-cropped, or planted in two or more crops, one following the other within the year. Of the total cropland in 1947, about 38 percent was used for intertilled crops; 53 percent for close-growing and sod crops; 4 percent for fallow land; and 5 percent was temporarily idle or standing without a crop.<sup>2</sup>

In 1944, approximately one-half of the crop-failure land was located in the Great Plains. More than half of the idle and fallow cropland was located in the 17 Western States, including the Great Plains, Mountain, and Pacific regions. Because of favorable rainfall, weather, and other factors, the total crop failure acreage was only 10 million acres in 1944, as compared with 21 million acres in 1939 and 64 million acres in 1934—a year of severe drought. Drought hazard is greatest in the Great Plains, where crop failure amounted to 36 percent of all land planted in 1934, 12 percent in 1939, and 4 percent in 1944.

By the end of World War II the acreage of cropland harvested was or at near an all-time peak in four groups of States: Lake States, Corn Belt, Mountain, and Pacific. In contrast, cropland harvested continued to decline in the Appalachian, Southeast, and Mississippi

<sup>2</sup> Intertilled crops include all those cultivated in rows (except orchards, vineyards, and small fruit) and all large seeded legumes grown alone, whether in rows, as drilled, or broadcast. Close-growing crops include all annual close-seeded cereals used for any purpose and other non-sod-forming annual crops not used for hay and not included with intertilled crops. Sod crops include all sod-forming tame hay and hay and cover-crop seed crops. Rotation pasture is often included as a sod crop in acreage estimates but is excluded from the crops and acreage shown above.

Delta States. Although decided increases occurred in the Great Plains, acreages were considerably below the high totals of the early thirties.

#### LAND AVAILABLE FOR CROPS

A part of the pasture land is available, in case of need, for immediate use for crops. One measure of this area is the "plowable pasture" acreage; that is, the pasture land (as defined by the census of 1940) "which could have been used for crops without additional clearing, draining, or irrigating," provided it would be cultivated under good farm practices. Plowable pasture, plus existing cropland planted, fallow, or idle, provides a measure of the land readily available for crop production.

Plowable pasture in 1945, including 48 million acres of pasture which had been plowed within 7 years is estimated at 109 million acres (table 3). Thus, for every 4 acres of cropland planted, idle or fallow there is on the average 1 acre of plowable pasture land that also could have been used for crops but that is now contributing through the production of forage for livestock. The plowable pasture is rather widely distributed throughout the country with the larger acreages in the Great Plains, the Appalachian and Southeastern States, and the Corn Belt. Roughly, 12 percent of the land in the Corn Belt is plowable pasture, 9 percent of the Appalachian and Southeastern States, and 7 percent of the Great Plains States.

Land immediately available for crops as defined above totals 512 million acres. The Northern Plains States (109 million acres) and the Corn Belt States (101 million acres) contain more than 40 percent of the land available for crops. Sixty-one percent of the land in the

TABLE 3.—*Plowable pasture, United States, 1945*<sup>1</sup>

Region	Acreage	Percentage of total	Percentage of land area
	<i>Million acres</i>	<i>Percent</i>	<i>Percent</i>
United States.....	109	100.0	5.7
Great Plains:			
Northern Plains.....	17	15.3	8.5
Southern Plains.....	13	11.8	6.0
Total.....	30	27.1	7.2
Appalachian and Southeastern.....	22	20.7	8.7
Corn Belt.....	20	18.7	12.2
Western States:			
Pacific.....	13	11.9	2.0
Mountain.....	4	3.6	2.3
Total.....	17	15.5	2.2
Northeastern and Lake.....	14	12.9	6.1
Mississippi Delta.....	6	5.1	6.0

<sup>1</sup> Individual items adjusted to total.



TABLE 4.—*Land available for crops, United States, 1945*<sup>1</sup> (*cropland plus plowable pasture*)

Region	Acreage	Percent- age of total	Percentage of land area
	<i>Million acres</i>	<i>Percent</i>	<i>Percent</i>
United States.....	512	100. 0	26. 9
Great Plains:			
Northern Plains.....	109	21. 3	55. 7
Southern Plains.....	58	11. 4	27. 3
Total.....	167	32. 7	40. 9
Corn Belt.....	101	19. 8	61. 1
Appalachian and Southeastern.....	76	14. 8	29. 6
Northeastern and Lake.....	76	14. 8	33. 2
Western:			
Pacific.....	24	4. 7	11. 9
Mountain.....	44	8. 5	7. 9
Total.....	68	13. 2	9. 0
Mississippi Delta.....	24	4. 7	26. 0

<sup>1</sup> Individual items adjusted to total.

Corn Belt States is classed as available for crops, contrasted with only 8 percent in the Mountain States region (table 4).

Plowable pasture as defined above includes some areas in the Western States that have topography and soils suitable for crops but that probably are too arid for continuous cultivation without irrigation. The Census of Agriculture, 1945 (33), reports nearly 48 million acres of cropland used for pasture which had been plowed within the last 7 years (table 5). The 31 Eastern States contain 69 percent of this land. The productivity of much of the land classified as plowable pasture is lower in relation to that actually cropped. It usually is more marginal and has more obstacles to cultivation, such as steep slopes, rock outcrop, stumps, poor drainage, or less favorable soil and moisture conditions. It is probable that some land formerly reported as plowable pasture but that has not been plowed in the last 7 years in the 17 Western States may not be available for crops because of climatic limitations. Cultivation of this land is physically possible but not always feasible or profitable every year because of periods of drought. An estimated 4 million acres of sod has been broken for wheat in the Great Plains and Mountain States, however, mainly in 1945 and 1946. At least half of this is classed as high-risk land unsuited to continuous dry-land cultivation.

According to surveys by the Soil Conservation Service, a sizable acreage of the land classified as plowable pasture is not suitable for cultivation. The Soil Conservation Service has estimated that there are 466 million acres suitable for cultivation after needed land use adjustments and reasonable conversions are accomplished. The sec-

tion of this report headed "Land Unsited to Cultivation," gives additional data on crop and plowable pasture land not suitable for continuous cultivation.

TABLE 5.—*Cropland used for pasture, United States, 1945*

Region	Plowed in last 7 years <sup>1</sup>		Other plowable pasture		Total	
	Acreage	Percent- age of total <sup>2</sup>	Acreage	Percent- age of total <sup>2</sup>	Acreage	Percent- age of total <sup>2</sup>
	<i>Million acres</i>	<i>Percent</i>	<i>Million acres</i>	<i>Percent</i>	<i>Million acres</i>	<i>Percent</i>
31 Eastern States-----	33	52. 7	29	47. 3	62	100. 0
17 Western States-----	15	31. 7	32	68. 3	47	100. 0
Total-----	48	43. 7	61	56. 3	109	100. 0

<sup>1</sup> U. S. CENSUS OF AGRICULTURE, 1945 (34).

<sup>2</sup> Percentages computed from unrounded data.

#### PASTURE AND RANGE LAND<sup>3</sup>

Pasture and range land (including plowable<sup>4</sup> and nonplowable grassland and grazed forest land) is the largest acreage of land use in the United States. It accounts for 1,052 million acres, or 55 percent of the land area. Many types of grazing land are included, such as the highly productive rotation pastures of legumes and mixed grasses found especially on the better soils in the Corn Belt and Lake States; improved bluegrass pastures found especially in the Northern States and in Kentucky and Tennessee; the coastal marshes and prairie glades of the Southeast and Mississippi Delta areas; the cut-over timber tracts and abandoned croplands found throughout the eastern half of the country; and the short grass of the High Plains, the mesquite grass, sagebrush, and the open forests of the West.

These pasture and range lands make valuable contributions of feed to the farm and ranch livestock enterprises. More than one-third of the feed for livestock comes from pasture and range land. When hay is included, over half the feed is produced by the grassland of the country.

Even in the Corn Belt States and in the South, pasture accounts for 20 to 30 percent or more of all feed fed, while in several Western States 50 to 75 percent of all feed is obtained from pasture. All hay accounts for one-fourth or more of all feed consumed in the dairy areas and in most Western States. In the South, where the pasture season is longer, hay is less important than pasture (15, pp. 20-21; 16, pp. 77-89). Dairying in the North and East depends greatly upon improved

<sup>3</sup> See WOOTEN, H. H. and BARNES, C. P. (53).

<sup>4</sup> The preceding section discusses plowable pasture as a possible source of additional cropland but as plowable pasture was omitted from the estimates of the acreage of present cropland and as it is used for forage production, it is included here with other pasture and range land.

pasture as well as upon feed crops and unimproved grassland and woodland grazing areas. With limited available cropland acreages, the beef cattle and sheep-raising industries of the West depend mostly upon native range vegetation for feed.

The 11 Western States contain 50 percent of the pasture and grazing land and the Great Plains States 23 percent, leaving only 27 percent in the eastern half of the country. Much of this (17 percent) is located in the South (table 6). Although the Northeast Lake States, and Corn Belt regions in combination had 55 percent of the milk cows and 31 percent of other cattle in 1945, they had only 10 percent of the pasture and grazing land. Because of the quality of this pasture it is of considerable importance. Much of the improved pasture in the Northern States has a very high carrying capacity compared with pasture land in some other regions.

TABLE 6.—*Pasture and grazing land, United States, 1945*<sup>1</sup>

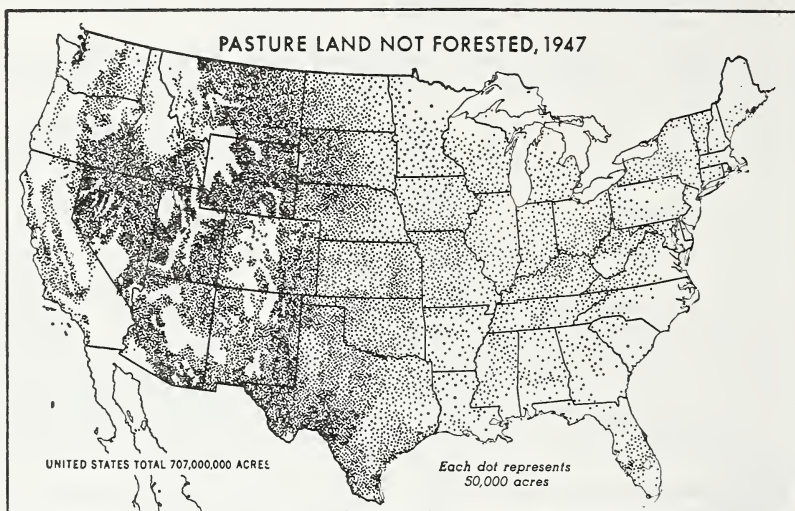
Region	Total		Grassland pasture		Forest and woodland grazed	
	Acre-age	Per-centage of United States <sup>2</sup>	Acre-age	Per-centage of United States <sup>2</sup>	Acre-age	Per-centage of United States <sup>2</sup>
United States.....	Million acres 1, 052	Per-cent 100. 0	Million acres 707	Per-cent 100. 0	Million acres 345	Per-cent 100. 0
Western:						
Mountain.....	426	40. 5	341	48. 3	85	24. 6
Pacific.....	97	9. 2	60	8. 5	37	10. 7
Total.....	523	49. 7	401	56. 8	122	35. 3
Great Plains:						
Northern Plains.....	88	8. 4	85	12. 1	3	1. 0
Southern Plains.....	154	14. 6	112	15. 8	42	12. 2
Total.....	242	23. 0	197	27. 9	45	13. 2
Southern:						
Appalachian.....	62	5. 9	23	3. 1	39	11. 4
Southeast.....	65	6. 2	11	1. 6	54	15. 5
Mississippi Delta.....	54	5. 1	11	1. 6	43	12. 5
Total.....	181	17. 2	45	6. 3	136	39. 4
Northern:						
Corn Belt.....	57	5. 3	38	5. 3	19	5. 2
Lake States.....	30	2. 9	15	2. 1	15	4. 4
Northeast.....	19	1. 9	11	1. 6	8	2. 1
Total.....	106	10. 1	64	9. 0	42	12. 1

<sup>1</sup> Individual items adjusted to total.<sup>2</sup> Percentages were computed from unrounded data.



Land in crops, such as wheat, other small grains, and hay, in some regions is sometimes pastured for short periods in winter or early spring and then later is harvested. After harvest of wheat, corn, and hay, considerable pasturage is obtained from fenced fields in the Corn Belt and general farming regions. Aftermath pasture, following harvest of hay, is especially important in some areas. In addition, considerable land is pastured before the preparation of fall-seeded crops. Winter cover crops also furnish pasture in the spring before the plowing for summer crops is done.

As a considerable acreage of land in this country has a covering of grasses or forage plants but contains some scattered trees, the subdivision of pasture and range land into either "grassland" or "forest and woodland grazed" is subject to variation due to differences in inter-



BAE 46518

FIGURE 4.—The 707 million acres of nonforested pasture and grazing land provide enough low-cost forage to meet nearly one-third of the feed and forage requirements of farm and ranch livestock. This pasture and grazing land varies widely in grass and other forage and in carrying capacities. About two-thirds is privately owned, the remainder consisting of national forest, public domain in grazing districts, and other publicly owned land. Of the total of nonforested pasture and grazing land, only about 100 million acres are adapted to crops.

pretation and classification and is subject also to some possible overlapping of estimates. In the Mountain and Northern Plains States more than three-fourths of the grazing land is classified as grassland and less than one-fourth as timber and woodland. In the Pacific, Corn Belt, and Southern Plains States about two-thirds is classified as grassland and one-third as woodland grazed. In the Northeastern and Lake States region the grazing area is estimated to be approximately 52 percent grassland and 48 percent grazed woodland. Throughout the South grazing land is approximately one-fourth grassland and three-fourths forest or woodland.

The larger aggregate areas of grassland are located in the 11 Western States (401 million acres) and the Great Plains States (197 million acres), with only small areas relative to the national total in the South, the Corn Belt, and the Northeastern and Lake States (fig. 4).

The larger aggregate areas of grazed forest land are located in the South (136 million acres) and the 11 Western States (122 million acres).

In addition to the 707 million acres of open or nonforested pasture and grazing land, it is estimated that 345 million acres of forested land are grazed. A large part of this forest land used for grazing is in the pine and hardwood forests of the South and the arid and semiarid woodlands of the West (table 6). Much of this land has a varied cover—depending upon climate, soil, and elevation as well as fire and timber-cutting practices—and includes fairly open commercial forest as well as cut-over brush and shrub growth, and many areas of grass and other forage plants.

Altogether, in the 17 Western States and Great Plains States, about 765 million acres are used for grazing. This includes about 65 million acres of improved pasture and 700 million acres or more of range. The livestock-carrying capacity of large reaches of the western range is low, especially the arid woodland and shrub country, and a large proportion does not provide year-long pasture. Stockmen and herdsmen migrate with the season, moving their livestock to the mountains and higher elevations in summer and returning to the lower land in winter.

The diversity in vegetative types, climate, and topography in the range country are accompanied by great diversity in the seasonal use of grazing land. Range lands are grazed for different periods, from 3 to 4 months in summer to the full year. Seasonal use may be grouped into five classes (fig. 5).

#### FOREST LAND

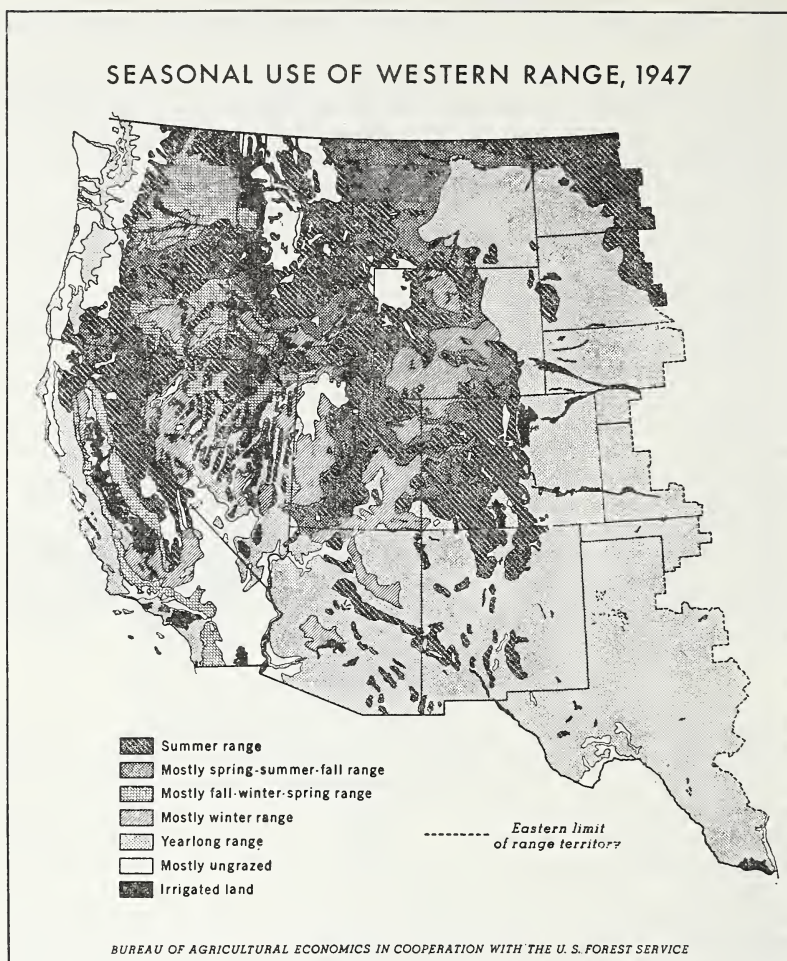
Some 624 million acres are classified as forest land (41). Some of this land, however, is reserved from timber cutting and located in State and national parks, military reservations, and other preserves. The reserved area is estimated at 14 million acres and in this report is included as "special-use areas." These areas include parks, wildlife refuges, military reservations, and other lands devoted to similar public purposes. In addition, some woodland and brushland areas have been included in the "nonforested pastures in farms"—estimated at 8 million acres. After making these deductions for the purposes of this study, about 602 million acres of available forest land remain. This includes some open grazing land and other open areas prospectively available for commercial timber production and includes noncommercial woodlands.

The relative proportions of land in forest for the different regions are shown in figure 6.

About 36 percent of the forest land is found in the 11 Western States; some 32 percent in the South (Appalachian, Southeastern, and Mississippi Delta States), and about 19 percent in the northeastern and Lake States (table 7). The Great Plains and the Corn Belt States together contain 30 percent of the land area but only 13 percent of the available forest.

Seventy-five percent of the available forest land is classed as commercial forest land. Most of the available forest land in the East, North, and South is of commercial character, whereas about two-thirds in the Great Plains States and one-half in the Western States is classed as noncommercial woodland growth. The noncommercial woodland





BAE 46517

FIGURE 5.—The variety of climatic and land conditions in the Western States means differences in the grazing seasons as well as type and value of the grazing. Higher areas furnish 3 to 6 months of grazing in summer. Foothills and plateaus are available most of the year, but the capacity generally will not carry animals more than 6 to 8 months without change of pasture. Desert or winter ranges lack water and so are used by stock only in winter. Much of the extreme southern desert is practically unusable for livestock, but deep wells and irrigation are making more of it available. Range livestock is fed in the irrigated valleys in winter.

includes inaccessible alpine ranges, chaparral, mesquite, piñon-juniper, and semiarid shrub and brush growth.

Nearly two-thirds of the saw-timber acreage is located in the States that lie east of the Great Plains. This is mainly second-growth timber and contains less volume than does the more limited acreage of saw timber in the West. About 30 million acres of pine forest in the South are used actively or held for production of such naval stores



TABLE 7.—*Extent of forest land and character of growth, by regions, United States, 1945*

Region <sup>1</sup>	Total available forest land	Percentage of total	All forest land, <sup>2</sup> character of growth	
			Commer- cial	Noncom- mercial
	<i>Million Acres</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
United States.....	602	100. 0	75. 4	24. 6
Western:				
Pacific.....	97	16. 1	63. 0	37. 0
Mountain.....	121	20. 1	35. 1	64. 9
Total.....	218	36. 2	49. 0	51. 0
Appalachian and Southeastern.....	140	23. 2	98. 4	1. 6
Northeastern and Lake.....	113	18. 8	96. 2	3. 8
Mississippi Delta.....	51	8. 5	99. 8	. 2
Great Plains:				
Northern Plains.....	4	. 7	89. 7	10. 3
Southern Plains.....	47	7. 8	32. 0	68. 0
Total.....	51	8. 5	37. 2	62. 8
Corn Belt.....	29	4. 8	99. 4	. 6

<sup>1</sup> Regions are groups of States.<sup>2</sup> As shown by Forest Service reappraisal data.

as turpentine, resin, tar products, and chemicals, in addition to saw timber, pulpwood, poles, fuel wood, and other products.

More than half the forested area, or 345 million acres, is grazed by livestock some part of each year. Much of the ungrazed forest land is in the 11 Western States, the Northeast and Lake States regions, and the South. There are only small tracts of ungrazed forest in the Corn Belt and Great Plains. From the standpoint of utilization of local forest grazing, the proportion of available forest that is grazed is highest in the Southern Plains (91 percent) and lowest in the Northeast region (20 percent).

#### SPECIAL-USE AREAS <sup>5</sup>

Urban areas of high value are found especially in the industrial, populous parts of the country, as in the Northeast and the Lake States (table 8). In Connecticut, Massachusetts, New Jersey, and Rhode Island from 8 to 15 percent of the land is in urban use and rural villages and residences use a considerable area. In 10 States urban areas cover 1.5 to 4 percent of the land. In the other States they are a relatively small part of the land, constituting 1 percent or less in each State; in most States less than 1 percent. Altogether, 15 million

<sup>5</sup> Includes farm roads and lanes, farmsteads, rural public highways and roads, rural railroad rights-of-way, parks, game refuges, airports, military lands, and urban lands.

acres are occupied by the built-up cities and towns of 1,000 population or over. An additional 10 million acres are estimated to be used chiefly in rural villages and other built-up places of 100 population and over. This additional 10 million acres in rural villages and built-up areas is at present classified within the major land-use areas of forest, grazing, farm, and other land. It could not be separated readily without revising accepted land-use areas.

Rural highways, roads, railroads, farmsteads, and farm roads and lanes are roughly distributed in accordance with the population and numbers of farms (table 9).

Although there are parks, game refuges, and military reservations in nearly all parts of the country, the larger ones are located in the

TABLE 8.—*Estimated urban areas of cities and towns of 1,000 population and over, United States, 1945*<sup>1</sup>

Region	Acreage	Percentage of total	Proportion of land area <sup>2</sup>
	<i>Mil. acres</i>	<i>Percent</i>	<i>Percent</i>
United States.....	15. 0	100. 0	0. 8
Northeastern and Lake.....	5. 3	35. 4	2. 3
Corn Belt.....	2. 6	17. 3	1. 6
Appalachian and Southeastern.....	2. 6	17. 3	1. 0
Western.....	2. 5	16. 7	. 4
Great Plains.....	1. 4	9. 3	. 3
Mississippi Delta.....	0. 6	4. 0	. 6

<sup>1</sup> Estimated area of urban places having population 1,000 and over for all States. For more detailed data and sources, refer to table 40.

<sup>2</sup> Individual items adjusted to total.

TABLE 9.—*Land in special land use areas, United States, 1945*<sup>1</sup>

Region	Total		Urban areas, rural highways and roads, railroad rights-of-way and airports		Parks, game refuges, military reservations, other		Farmsteads, farm roads and lanes	
	<i>Mil-lion acres</i>	<i>Per-cent</i>	<i>Mil-lion acres</i>	<i>Per-cent</i>	<i>Mil-lion acres</i>	<i>Per-cent</i>	<i>Mil-lion acres</i>	<i>Per-cent</i>
United States.....	100	100. 0	39	100. 0	49	100. 0	12	100. 0
Western States.....	42	42. 0	8	20. 5	33	67. 4	1	8. 3
Northeastern and Lake.....	16	16. 0	10	25. 6	4	8. 2	2	16. 7
Appalachian and Southeastern.....	14	14. 0	6	15. 4	6	12. 2	2	16. 7
Great Plains.....	14	14. 0	7	18. 0	4	8. 2	3	25. 0
Corn Belt.....	10	10. 0	6	15. 4	1	2. 0	3	25. 0
Mississippi Delta.....	4	4. 0	2	5. 1	1	2. 0	2	8. 3

<sup>1</sup> Individual items adjusted to total.

West, particularly in the Rocky Mountain States. Farmsteads, feed-lots, and farm roads and lanes included here among the special use areas are an integral part of farms and ranches and make substantial contributions to agricultural production. Certain of the special-service areas, as highways, roads, and railroads, directly or indirectly affect the productivity and efficiency of agriculture.

#### MISCELLANEOUS OTHER LAND

Because of the shortness of the grass and the absence of trees and surface water, great reaches of the Great Plains and arid mountain and valley country of the West appeared to the early settlers as uninhabitable desert land (25, p. 183). But most of it is now used for one or more purposes and the unused tracts are being reduced by provision of stock water and other improvements. Grazing predominates in large territories. Irrigation water has been made available to certain areas by diverting stream flow, building reservoirs, and digging or drilling wells. Reservations have been established for recreational and wildlife purposes, for example: Grand Canyon National Park in Arizona; Death Valley National Monument in California and Nevada; and the Desert Game Range of the United States Department of the Interior in Nevada. Development of water supplies and establishment of reservations for special purposes have reduced the area of miscellaneous other land.

There remain at present about 93 million acres of other land not generally used for agriculture, grazing, forests, or special uses. Most of it generally is classified as having low surface-use value for agriculture, except for incidental values for wildlife and watershed protection and recreation. Included are unreserved desert, rock, sand dune, open swamp, marsh, eroded hill, and similar lands. Some have mineral and other subsurface value.

About 45 percent of the other land, or land generally having low value for agriculture, is located in the 11 Western States, the rest being rather widely scattered throughout the remainder of the country (table 10).

TABLE 10.—*Land generally having low agricultural value except for wildlife and watershed protection and recreation, United States, 1945*<sup>1</sup>

Region	Total acreage	Percent- age of total
	<i>Million acres</i>	<i>Percent</i>
United States.....	93	100. 0
Western States.....	42	45. 1
Appalachian and Southeastern.....	15	16. 1
Northeastern and Lake.....	10	10. 8
Great Plains.....	10	10. 8
Mississippi Delta.....	8	8. 6
Corn Belt.....	8	8. 6

<sup>1</sup> Individual items adjusted to total.



LAND IN FARMS AND LAND NOT IN FARMS <sup>6</sup>

The 1945 census indicates that there are some 1.142 million acres in farms. This is 60 percent of our land area. Included are practically all of the cropland, the plowable pasture land, and sizable proportions of the nonplowable pasture land, grazed and ungrazed forest, some of the special use areas, and some of the "land having low agricultural use value" (table 11).

Of the land in farms, more than one-third is used for crops, including land being fallowed or idle, and more than half for pasture and

TABLE 11.—*Land in farms and land not in farms, United States, 1945*

Use	Total		In farms		Not in farms	
	Acre-age	Per-cent- age of total	Acre-age	Per-cent- age of total	Acre-age	Per-cent- age of total
	<i>Million acres</i>	<i>Percent</i>	<i>Million acres</i>	<i>Percent</i>	<i>Million acres</i>	<i>Percent</i>
Cropland <sup>1</sup> .....	403	21. 1	403	35. 3	0	0. 0
Pasture and grazing land:						
Grassland.....	707	37. 1	529	46. 3	178	23. 3
Forest <sup>2</sup> .....	345	18. 1	95	8. 3	250	32. 8
Land used for crops and pas- ture.....	1, 455	76. 3	1, 027	89. 9	428	56. 1
Forest land not grazed.....	257	13. 5	71	6. 2	186	24. 4
Total land used for crops, pasture, and forest.....	1, 712	89. 8	1, 098	96. 1	614	80. 5
Special-use areas <sup>3</sup> .....	100	5. 2	29	2. 6	71	9. 2
Miscellaneous <sup>4</sup> .....	93	5. 0	15	1. 3	78	10. 3
Grand total <sup>5</sup> .....	1, 905	100. 0	1, 142	100. 0	763	100. 0

<sup>1</sup> Includes cropland harvested, crop failure, and cropland idle or fallow.

<sup>2</sup> Exclusive of forest land in parks, preserves, etc., which is included in special-use areas.

<sup>3</sup> Urban areas, highways and roads, railroads, airports, parks, game refuges, military reservations, farmsteads, farm roads, and lanes.

<sup>4</sup> Desert, rock, sand dunes, etc. Land generally having low agricultural value.

<sup>5</sup> Individual items adjusted to total.

<sup>6</sup> Census of Agriculture, 1945 (34). A farm, for census purposes, is all the land on which some agricultural operations are performed by one person, either by his own labor or with the assistance of members of his household, or hired employees. The land operated by a partnership is likewise considered a farm. A "farm" may consist of a single tract, or a number of separate tracts, and the several tracts may be held under different tenures, as when one tract is owned by the farmer and another is rented by him. When a landowner has one or more tenants, renters, croppers, or managers, the land operated by each is considered a farm. Thus, on a plantation the land operated by each cropper, renter, or tenant is reported as a separate farm, and the land operated by the owner or manager by means of wage hands is reported as a separate farm. Dry-lots or barn dairies, nurseries, greenhouses, hatcheries, fur farms, mushroom cellars, apiaries, cranberry bogs, etc., are included. "Fish farms," "fish hatcheries," "oyster farms," and "frog farms" are not included, nor is any tract of less than 3 acres, unless its agricultural product in 1944 was valued at \$250 or more.

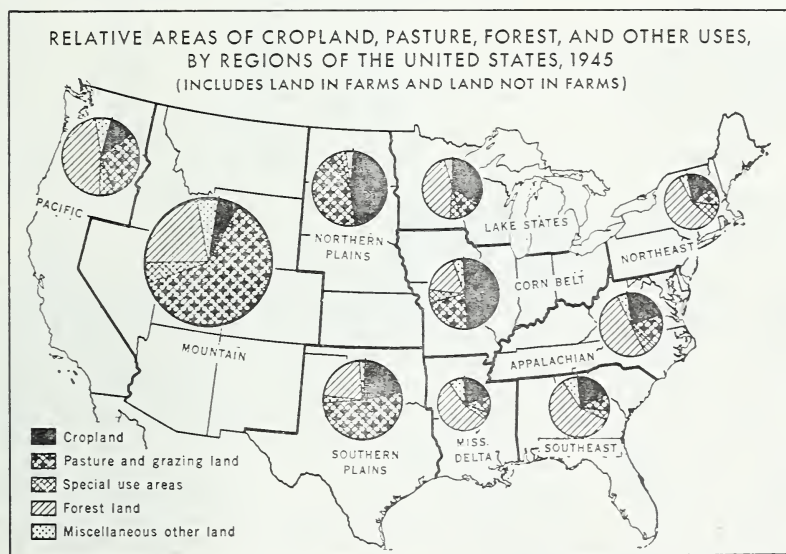
grazing. The remainder includes ungrazed forest land, farmsteads, farm roads and lanes, public highway and railroad rights-of-way crossing farm lands, and land classified as being of slight agricultural value. This last may include some odd spots that might have been used for crops, pasture, or timber production.

More than half the land not in farms (land not enumerated in the Census of Agriculture) is grazed, about one-fourth is ungrazed forest land, and the rest is about equally divided between special-uses and land having slight agricultural value.

Because of their great extent, the Great Plains States contain nearly one-third of the land in farms and the 11 Western States more than one-fourth. The 11 Western States also contain nearly 60 percent of the land not in farms (table 12). The remainder not in farms is scattered throughout the other regions, with the lowest aggregate quantity in the Corn Belt (2.9 percent of the total).

From the viewpoint of local concentration of farm land, the Great Plains and the Corn Belt lead. More than 85 percent of the land of these regions is in farms. In the other regions from about 40 to 60 percent is in farms, with the lowest proportion in the 11 Western States, 41.9 percent.

The relative areas of cropland, pasture, forest, and other major uses of land, both in farms and not in farms, for the chief agricultural regions are summarized in figure 6 and table 13. Cropland and pas-



BAE 45774

FIGURE 6.—Total acreage in agriculture varies greatly between regions. For example, about 50 percent of the Corn Belt and northern Great Plains States is cropland, while in the Northeast and Southeast about 20 percent is cropland, and in the Mountain and Pacific States less than 10 percent. Grazing land, woodland, and forests are inseparable from arable farming over immense areas. The grazing land lying outside farms, both open and forested, supplements land in farms and is used interchangeably with them every year. Altogether, 1,570 million acres, or 82 percent of the total land area, were used for agricultural production in 1944.

ture make up from 70 to 90 percent of the land area in three regions—the Corn Belt, the northern Plains, and the southern Plains. In four regions, forest land comprises 50 percent or more of the area. These forest areas include the Northeast, Appalachian, Southeast, and Mississippi Delta. The Pacific and Lake States regions have large proportions of their land area in forest—more than 40 percent. All regions, however, have approximately 30 percent or more of their land in cropland and nonforest pasture. For the country as a whole, cropland covers about 21 percent of the land area; open or nonforest pasture and grazing land, 37 percent; forest and woodland, 32 percent; and special use and miscellaneous areas, 10 percent.

TABLE 12.—*Extent and location of land in farms and land not in farms, by regions, United States, 1945*<sup>1</sup>

Region <sup>2</sup>	Land in farms		Land not in farms	
	Acreage	Percent- age of total	Acreage	Percent- age of total
	<i>Million Acres</i>	<i>Percent</i>	<i>Million Acres</i>	<i>Percent</i>
Great Plains.....	358	31. 4	50	6. 7
Western States.....	316	27. 7	438	57. 3
Appalachian and Southeastern.....	153	13. 4	104	13. 6
Corn Belt.....	144	12. 5	22	2. 9
Northeast and Lake.....	124	10. 9	103	13. 5
Mississippi Delta.....	47	4. 1	46	6. 0
Total.....	1, 142	100. 0	763	100. 0

<sup>1</sup> Individual items adjusted to total.

<sup>2</sup> Regions classified by States.

The proportion of the land suitable for crop use, the kinds of crops grown, the level of crop and forage yields, and the numbers of live-stock raised and fed all are reflected in the quantity and value of agricultural production. The value of production reflects area suitable for crops, pasture and farm woodland use, and the general extent of other uses for land. In 1944, cash income from the sale of farm products somewhat exceeded 16 billion dollars and the value of products used by farm households was 1.9 billion dollars.<sup>7</sup> Figure 7 shows the concentration of production in terms of value of product in 1944, in the Corn Belt, Lake States, and Northeast regions, with local concentrations in the Pacific States, Mississippi Delta, Great Plains, and Southeastern States (table 14).

<sup>7</sup> Favorable weather, high yields, wartime prices, etc., made for a large value of product in 1944. Value of product does not measure net farm income and can be considered only as a rough approximation of gross farm income. This is true because duplications due to interfarm sales are included, and no adjustment is made for changes in inventory. More than two-thirds of the total value of all farm products in 1944 was produced on only one-fifth of the farms. The land used directly for agriculture consists of 1,142 million acres of farm land and 428 million acres of nonfarm land grazed, or a total of 1,570 million acres.



TABLE 13.—*Major uses of land, by regions, United States, 1945*

[Percentage of total land area]

Region (groups of States)	Total land area	Crop-land	Pasture and grazing land non-forested	Forest land	Special use areas	Miscellaneous other land, most of which has low agricultural value
	Percent	Percent	Percent	Percent	Percent	Percent
Northeast.....	100.0	19.3	11.0	56.0	9.3	4.4
Lake States.....	100.0	33.7	12.2	44.4	5.7	4.0
Corn Belt.....	100.0	48.9	22.8	17.5	6.0	4.8
Appalachian.....	100.0	22.0	17.3	50.4	5.6	4.7
Southeast.....	100.0	19.7	8.9	58.7	5.2	7.5
Mississippi Delta.....	100.0	20.1	11.5	55.3	4.0	9.1
Northern Plains.....	100.0	47.2	43.7	2.1	3.9	3.1
Southern Plains.....	100.0	21.3	52.3	21.8	2.8	1.8
Mountain.....	100.0	5.6	62.1	22.1	5.1	5.1
Pacific.....	100.0	9.9	29.3	47.1	6.8	6.9
United States..	100.0	21.2	37.1	31.6	5.2	4.9

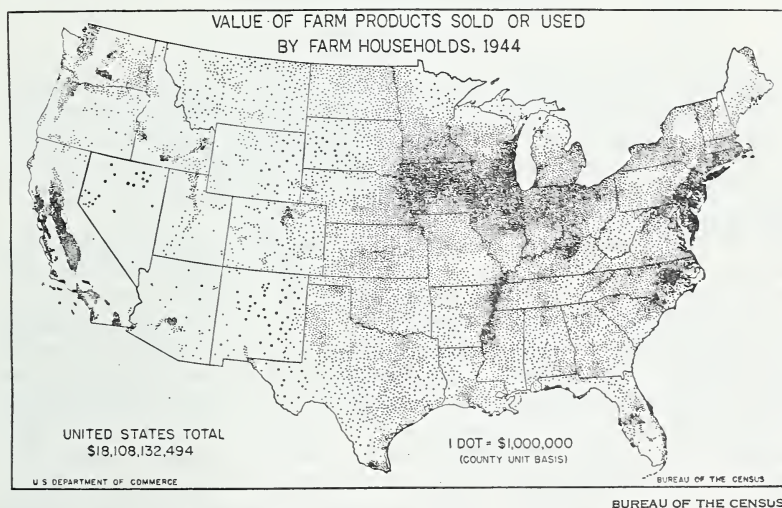


FIGURE 7.—In 1944, about 90 percent of the more than 18 billion dollars reported by the census as the value of farm products sold or used by farm households represented products sold; the remaining 10 percent, products used by farm households. Crops accounted for 46.2, livestock and livestock products for 53.3, and forest products for 0.5 percent of the sales. One-half of the value from all sales and more than three-fifths from livestock and livestock products sales were reported in the Corn Belt, the Lake, and the Plains States. Cropland harvested in these 14 States comprised two-thirds of the Nation's total.

TABLE 14.—*Value of farm products sold or used by farm households, 1944*

Region	Value of farm products sold or used by farm households					
	Total	Products sold	Used by farm households	Per acre of land area used for agriculture		
				Total	Products sold	Products used
	<i>Million dollars</i>	<i>Million dollars</i>	<i>Million dollars</i>	<i>Dollars</i>	<i>Dollars</i>	<i>Dollars</i>
Corn Belt.....	3, 961. 1	3, 637. 7	323. 4	26. 53	24. 37	2. 17
Lake.....	1, 786. 9	1, 611. 5	175. 4	22. 02	19. 86	2. 16
Northeastern.....	1, 653. 3	1, 489. 7	163. 6	31. 25	28. 16	3. 09
Appalachian.....	1, 962. 4	1, 584. 5	377. 9	17. 63	14. 23	3. 39
Southeastern.....	1, 177. 4	947. 7	229. 7	11. 56	9. 30	2. 26
Mississippi Delta.....	907. 9	730. 8	177. 1	11. 06	8. 90	2. 16
Great Plains.....	3, 469. 8	3, 167. 0	302. 8	8. 77	8. 00	. 77
Mountain.....	1, 127. 7	1, 068. 1	59. 6	2. 40	2. 27	. 13
Pacific.....	2, 061. 6	1, 993. 6	68. 0	16. 46	15. 92	. 54
United States..	18, 108. 1	16, 230. 6	1, 877. 5	11. 53	10. 34	1. 20

## TRENDS IN LAND USE

## EARLY LAND USE

Originally, forest vegetation, including arid woodland, covered about 904 million of our acres, or 48 percent of the area; grass vegetation covered about 745 million acres, or 39 percent; and shrub vegetation about 157 million acres, or 8 percent. The remainder, about 99 million acres, or 5 percent, was barren, desert, rock, and other land (table 15 and fig. 8).

Before white settlements were made, most of the humid east was a relatively compact forest area. Far to the west, disconnected by the Great Plains, were the smaller, scattered western forests in the mountains interspersed with dry valleys and basins. Less than one-fifth of the original forest of commercial quality was located in the West.

Grasslands in the Eastern States (east of the Great Plains) were limited. Included were the prairies of the Corn Belt and Lake States, the black-belt lands of Mississippi and Alabama and of Texas, the Everglades of Florida, and limited other reaches especially along the coastline. In the West, the tall grasses extended into the Great Plains. Farther west, short grasses and desert grasses predominated; about half in the West was short grass and other grasses associated with limited rainfall.

Areas of shrub vegetation were associated with scant rainfall and high temperatures in the deserts.

The area of forest is only 70 percent of the original forest. More than half of the forest land in the East has been cleared and is now used for other purposes. In the West, forests of commercial quality

TABLE 15.—*Original vegetation areas, United States*

Natural vegetation	United States	East	West <sup>1</sup>
	<i>Million acres</i>	<i>Million acres</i>	<i>Million acres</i>
Forest vegetation:			
Virgin forests of commercial quality <sup>2</sup> -----	<sup>2</sup> 820	<sup>3</sup> 680	<sup>3</sup> 140
Pinon-juniper-----	74	0	<sup>4</sup> 74
Woodland-chaparral-----	10	0	<sup>4</sup> 10
Total-----	<sup>5</sup> 904	680	<sup>4</sup> 224
Grass vegetation:			
Tall grass-----	252	<sup>4</sup> 210	<sup>4</sup> 42
Short grass-----	280	0	<sup>4</sup> 280
Pacific bunchgrass-----	61	0	<sup>4</sup> 61
Semidesert grass-----	93	0	<sup>4</sup> 93
Grass—open forest-----	59	0	<sup>6</sup> 59
Total-----	745	210	535
Shrub vegetation:			
Sagebrush—grass-----	90	0	<sup>4</sup> 90
Southern desert shrub-----	25	0	<sup>4</sup> 25
Salt—desert shrub-----	42	0	<sup>4</sup> 42
Total-----	157	0	<sup>4</sup> 157
Barren land and other-----	99	40	<sup>4</sup> 59
Total-----	1, 905	930	<sup>7</sup> 975

<sup>1</sup> The land west of an irregular line extending south through the Dakotas to Mexico (44, pp. 2, 108).

<sup>2</sup> Our Forests: What They Are and What They Mean to Us (19, p. 9).

<sup>3</sup> Yearbook of Agriculture, 1922 (11, p. 88).

<sup>4</sup> Senate Doc. 199 (44, pp. 82, 83).

<sup>5</sup> 59 million acres of open forest land shown under grassland vegetation.

<sup>6</sup> Open forest land not accounted for in 140 million acres of virgin forest of commercial quality. The latter estimate includes 68 million acres of dense forest and 72 million acres of open forest. Senate Doc. 199 (44, pp. 82, 83).

<sup>7</sup> Sen. Doc. 199 (44, p. 108).

have been reduced by about 20 percent. Large acreages of cleared farm land in the East and South have reverted to forest one or more times, and then have been recleared for farming. It is estimated that 150 million acres have been subject to this long-time land use rotation of forest, cultivated crops, and pasture, to be followed by reversion to forest. As reclearing of brushland and sapling growth frequently is not so laborious or so expensive as the original clearing of virgin timber, much land passes back and forth from the cropland classification to woodland, depending on the need for land, the relative profitability of crops, and the varying availability of other employment to farmers.

Nearly all of the original tall-grass land has been converted to cropland and improved pasture. In the Central States favorable climate, fertile soils, and wide extents of smooth land have made the former tall-grass prairies one of the best farming sections of the



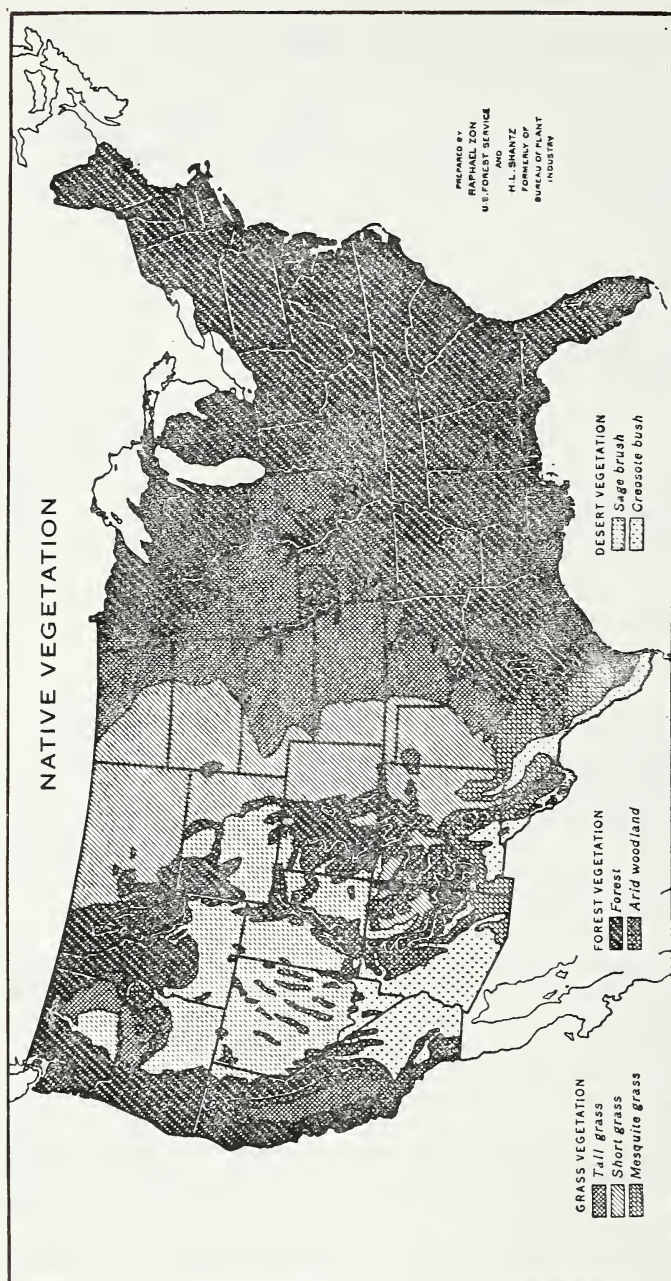


FIGURE 8.—Natural vegetation zones are broadly identified with climatic zones, particularly precipitation belts. In the United States land may be divided into four large classes, on the basis of original vegetative cover: (1) Forest, (2) grass, (3) shrub, and (4) barren and other land. Originally about half of our land was covered with forests, including arid woodland (piñon-juniper and chaparral), and about two-fifths was clothed originally with grass and herbaceous plants. More than half of the remaining forest and woodland, practically all of the grassland, and much of the remaining arid land, is pastured.

country. Farther west, in the short-grass regions, the better lands are used for irrigated or dry-farm crops and the rest is used for grazing.

Shrub-vegetation areas have been subject to less change. Relatively small tracts have been irrigated. In some areas shrub-type plants have replaced the short grasses and bunch grass and extended the acreage of shrub vegetative cover.

#### LAND USE, 1880-1945

The period 1880 to 1920 was characterized by expansion of agriculture. Cropland acreage more than doubled (table 16). Grassland available for grazing declined somewhat as sod lands were plowed up and nonagricultural uses increased for urban areas, parks, and roads. It is possible, however, that some idle grassland was included in the estimates for the early decades and that the acreage of pasture and range actually used increased until about 1890.<sup>8</sup> A decline in pasture and range, including forest and woodland grazed, is definitely indicated after 1900. Reduction between 1900 and 1920 was probably largely due to the plowing-up of sod land. Forest land declined from 1880 to 1910. The area of "other" land (urban areas, parks, roads, etc.) increased steadily (fig. 9).

Shifts in land use of considerable local importance occurred—croplands were developed by irrigation, drainage, and clearing, and submarginal land was converted to pasture or allowed to revert to forest—during the 25-year period 1920-45; but the period was one of relative stability in the over-all acreages devoted to the major land uses.

Land in farms has increased steadily. Farms and ranches included 28 percent of the total land in 1880, 50 percent in 1920, and 60 percent in 1945. More of the Indian lands and public and private grazing lands not enumerated previously as land in farms are now included. The changes in acreage of land in farms therefore represent mainly, agricultural development of the country, but partly, changes in the method of classifying and reporting land.

Since 1880, nonforested pasture and grazing land reported in farms and ranches has increased fourfold (table 17). Much of the increase in recent decades took place in the 17 Western States. All land used for pasture and range in farms in the Western States more than doubled, going from 229 million acres in 1910 to 464 million acres in 1945. Since 1880, pasture and range land outside of farms—not enumerated in farms—has declined to one-third its former size. Total pasture and range land (farm and nonfarm combined) decreased about 7 percent after 1900. The decrease in land available for grazing was chiefly in the land developed for crops or taken up by urban areas and public facilities.

With the higher values of land, feed, and livestock in the last few years, larger acreages of grazing land in all types of ownership—Federal, State, and railroad and other private lands—have been leased,

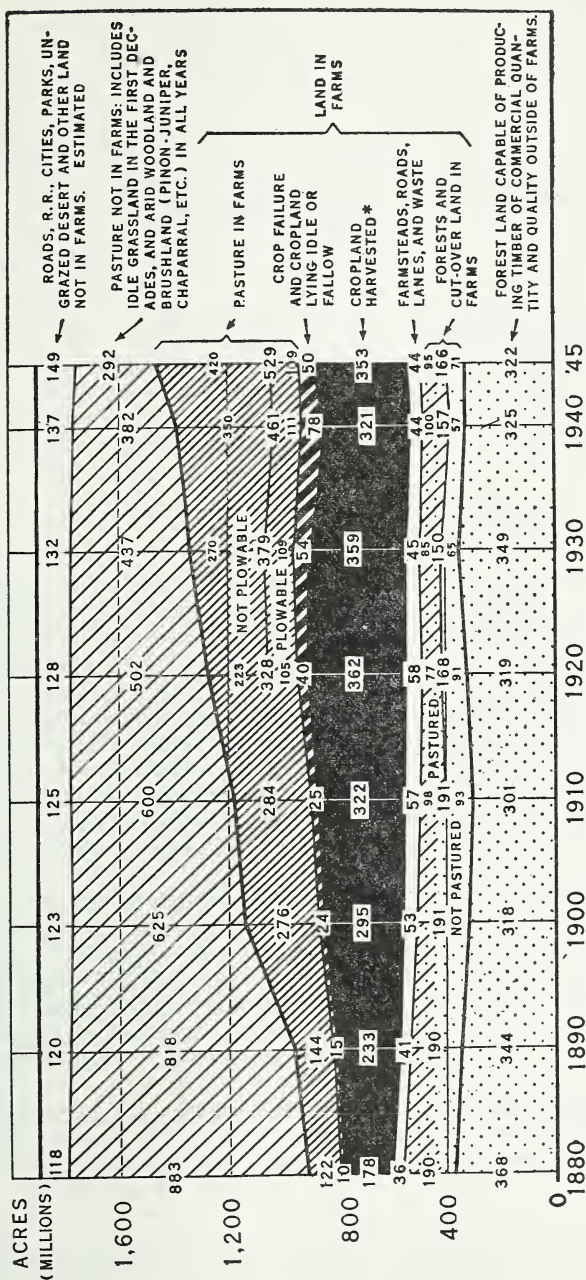
<sup>8</sup>L. C. Gray and others, in an article in the *Yearbook of Agriculture*, 1923, (1), concluded that " \* \* \* The actual area of land used for pasture has probably decreased since 1880, and almost certainly since 1890 \* \* \* "

TABLE 16.—*Trends in major land uses, United States, specified years, 1880-1945*

Land use	1880	1890	1900	1910	1920	1930	1940	1945
	<i>Million acres</i>	<i>Million acres</i>	<i>Million acres</i>	<i>Million acres</i>	<i>Million acres</i>	<i>Million acres</i>	<i>Million acres</i>	<i>Million acres</i>
Cropland <sup>1</sup> -----	188	248	319	347	402	413	399	403
Available pasture and range (nonforested) <sup>2</sup> -----	935	892	831	814	750	708	723	707
Forest and woodland <sup>3</sup> -----	628	604	579	562	567	607	602	602
Other <sup>4</sup> -----	154	161	176	182	186	177	181	193
Total-----	1,905	1,905	1,905	1,905	1,905	1,905	1,905	1,905
Land in farms-----	536	623	839	879	956	987	1,061	1,142
Land not in farms-----	1,369	1,282	1,066	1,026	949	918	844	763
Total-----	1,905	1,905	1,905	1,905	1,905	1,905	1,905	1,905
Pasture and range land available for grazing <sup>2</sup> (grassland and grazed forest)-----	(?)	(?)	1,131	1,121	1,066	1,042	1,065	1,052
Land used for crops and pasture-----	(?)	(?)	1,450	1,468	1,408	1,455	1,464	1,455
Land used for agriculture <sup>5</sup> -----	(?)	(?)	1,607	1,618	1,617	1,565	1,565	1,570
Land used for agriculture and forestry <sup>6</sup> -----	(?)	(?)	1,782	1,780	1,777	1,773	1,768	1,756

<sup>1</sup> Cropland harvested, crop failure, and cropland idle or fallow.<sup>2</sup> Includes idle grassland which probably existed in considerable acreages only before 1900.<sup>3</sup> Exclusive of forest land in parks, game refuges, military reservations, etc. Includes noncommercial forest land as follows: 1880=1910=70 million acres 1920=80; 1930=108; 1940=120; 1945=114 million acres.<sup>4</sup> Includes "special-use land areas," such as urban areas, highways and roads, farmsteads, parks, game refuges, military reservations, etc., and also land having slight surface-use value except for wildlife and watershed protection and recreation (lands such as desert, rock, and sand dunes).<sup>5</sup> All land in farms plus all nonfarm land grazed by livestock.<sup>6</sup> All land in farms plus nonfarm grazing land and forest land.<sup>7</sup> Data not available.





FIGURES PRIOR TO 1930 ARE MOSTLY ESTIMATES BASED ON THE CENSUS  
\* CROPLAND AGREEAGES ARE FOR THE YEAR PRECEDING THE DATE OF THE CENSUS

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FIGURE 9.—TREND IN LAND UTILIZATION, UNITED STATES, 1880-1945.

Notable shifts have occurred in the use of land since 1880. Total land in farms, in crops, and in pasture has increased generally in the West, whereas there have been decreases in land in farms in many parts of the East.

TABLE 17.—*Trend in acreage of pasture and grazing land available for grazing, United States, specific years, 1900-1945*<sup>1</sup>

Year	Pasture and grazing land			Pasture and grazing land			
	Total	Grass-land	Forest and wood-land grazed	In farms	Not in farms	As percentage of 1900 acreage	
						In farms	Not in farms
	Million acres	Million acres	Million acres	Million acres	Million acres	Per-cent	Per-cent
1945-----	1,052	707	345	624	428	172	56
1940-----	1,065	723	342	561	504	155	66
1930-----	1,042	708	334	464	578	128	75
1920-----	1,066	750	316	405	661	112	86
1910-----	1,121	814	307	382	739	105	96
1900-----	1,131	831	300	363	768	100	100

<sup>1</sup> Individual items adjusted to total.

or more definite arrangements have been made for their use than in former years, when there were larger unfenced open ranges. Since 1935, large additional acreages of public land have been leased or used for grazing under permits in individual allotments. Enactment of the Taylor Grazing District Act of 1934 and other measures for use and conservation of Federal lands probably have encouraged the classification of much public land as land in farms and ranches, especially when leased, and to a limited extent where specific areas have been used under permits by individual operators. It should be noted, however, that for many years before 1935, national-forest grazing lands were used under permit and large holdings of Indian and State land were leased.

The combined acreage used for crops, pasture, and range was slightly larger in 1945 than in 1900 but the composition of this area has changed greatly. In 1900, only 22 percent was cropland; in 1945 cropland made up 28 percent. "Land used for agriculture" (includes all land in farms plus nonfarm grassland and forest land grazed) has declined slightly since 1900 as the nonagricultural uses have increased. Similarly, total land used for agriculture and forestry have become smaller.

From 1930 to 1945, there was a net decrease in the total acreage of cropland of 10 million acres, due mainly to conversion to pasture and reversion to forest.<sup>9</sup> New cropland development in the 15-year period is estimated to have been about 15 to 20 million acres. However,

<sup>9</sup> Before the Agricultural Adjustment Administration program began in 1933 farmers usually thought in terms of "gross areas," which did not make allowances for land occupied by ditches, fence rows, turn rows, building sites. In later years they have thought more in terms of "net acres." This change in method of reporting undoubtedly had some effects on recent estimates of acreages of individual crops and of total cropland. See E. L. Langsford (18).

shifts of cropland to permanent pasture, woodland, and nonfarm uses far more than offset the new land. In other words, there possibly has been a gross shift of 25 to 30 million acres of cropland to grazing, forestry, and nonfarm uses and new land development of 15 to 20 million acres, resulting in a net decrease of 10 million acres or more in cropland.

A large part of the new land development occurred in the Lower Mississippi Valley by drainage, flood control, and clearing. A relatively large acreage of new land also was developed in the 11 Western States by irrigation and land clearing.<sup>10</sup> While this new land was being developed in the Mississippi Delta and in the West, large acreages of hill lands in some of the Eastern and Southern States were being shifted from cotton and other row crops to pasture and to forest. From 1930 to 1945, the planting of cotton declined from more than 43 to less than 18 million acres. Cotton acreages declined everywhere except in the irrigated parts of New Mexico, Arizona, and California. (18). In the Great Plains and Mountain regions nearly 9 million acres were returned to grass during the period 1932-46. (26) Abandonment of cropland was especially rapid in some of the poor, cotton-land hill areas, where population was moving out to the developing industrial centers and to the Western States. Where there are few opportunities for migration to better land or to better paid urban work, many poor-land hill farms are still cultivated.

Although the acreage of all cropland—or all land used for crops, fallow or idle—more than doubled from 1880 to 1920, the average acreage per capita in 1920 was 3.8, the same as in 1880. The average per capita acreage was 4.2 in 1900, the highest point; since 1920, it has dropped to 2.8 acres (table 18). The total cropland acreage has remained fairly constant—around 400 million acres from 1920 to 1947—fluctuating less than 6 percent from the high point to the low in the 27-year period. Nearly all the change in acreage of cropland per capita is owing to the great growth in population. In 67 years, 1880 to 1947, population rose from 50 million to 143 million persons—an increase of 93 million, or 186 percent.

The increases in agricultural production during the World War II period were achieved, in the main, on acreages previously in agricultural use. The acreage of harvested crops increased as the acreage of crop failure and idle and fallow cropland declined but total cropland increased only about 2 percent, 1940-47. Important to production were the increases in the acreage of intertilled crops, especially the increases in the Corn Belt and Lake States (mainly corn and soybeans) and in the Pacific region (table 19). Greater livestock production was achieved more through favorable rainfall, larger production of feed crops, improved feeding and management, and more intensive use of existing land resources (especially greatly increased use of ground limestone and fertilizers), rather than through expan-

<sup>10</sup> Harvested crops and pasture irrigated increased 2.8 million acres, or from about 17.8 million acres in 1939 to 20.6 million acres in 1944. Much of this increase was made by planting idle and fallow cropland and dry cropland in or adjacent to irrigation projects rather than by actual development of new land. Favorable weather and increased water supplies influenced the increased acreage of irrigated crops planted and harvested as well as the greater demand for products and higher returns to farmers.



sion of grazing onto new lands. Actually, the estimated acreage of all land grazed decreased from 1940 to 1945, as areas were withdrawn for military and other uses.

TABLE 18.—*Population and cropland in the United States, specified years, 1850-1947*

Year	Popula- tion <sup>1</sup>	Improved land <sup>2</sup>	Land avail- able for crops <sup>3</sup> (all cropland and plowable pasture	All cropland <sup>4</sup>	
				Land used for crops, includ- ing fallow or idle	Per capita
	Million	Million acres	Million acres	Million acres	Acres
1850.....	23	113			
1860.....	31	163			
1870.....	39	189			
1880.....	50	285		188	3.8
1890.....	63	358		248	3.9
1900.....	76	414		319	4.2
1910.....	92	478		347	3.8
1920.....	106	503		402	3.8
1925.....	114		505	391	3.4
1930.....	123		522	413	3.4
1935.....	127		514	415	3.3
1940.....	132		510	399	3.0
1945.....	139		512	403	2.9
1947.....	143		514	407	2.8

<sup>1</sup> Data on population for all years are from U. S. Bureau of the Census reports and releases.

<sup>2</sup> Improved land is all land regularly tilled or mowed, land in pasture that has been cleared or tilled, fallow land, land in orchards, gardens, vineyards, farmsteads. Data are from the census or are estimates based largely on census data. This classification was discontinued by the census after 1920.

<sup>3</sup> The land available for crops as reported by the Census of Agriculture 1925-40 is the nearest comparable figure for that given for improved land. Land available for crops includes all cropland and plowable pasture. Land available for crops in 1945 and 1947 is all cropland from census and National Summaries of the Agricultural Production Adjustment Survey reports, 1942 to 1946.

<sup>4</sup> All cropland as defined here is all land used for crops, including cropland harvested, failure, and fallow or idle cropland. Cropland also may be defined as acreage actually used for crops; that is, cropland harvested, crop failure, and fallow land, exclusive of that classified as idle. Land actually idle any one year, however, seldom is more than 6 to 8 percent of the cropland area as given in this table. Land is left idle for several reasons, including need for restoration of crop and pasture land by rotation and changes in use, and the desirability in some areas to have a small reserve to prepare for crops in advance of planting season. Some cropland remains idle because of wet weather, floods, or drought; lack of labor and machinery, or of opportunities for more profitable work.

#### LAND USE BY OWNERSHIP CLASSES, 1920-45

A complete record showing both the use and ownership of land in this country is not available anywhere so it is helpful to assemble existing data on the acreages of private and public land held for various purposes, even though the resulting totals may not be entirely complete and fully comparable in every respect. For purposes of this

TABLE 19.—*Cropland in intertilled crops, prewar and wartime, by regions*<sup>1</sup>

Region <sup>2</sup>	Cropland in intertilled crops		
	Prewar 1935-39	Wartime 1943	Percentage change
	<i>Million acres</i>	<i>Million acres</i>	<i>Percent</i>
Northeast.....	3. 9	4. 0	+3. 8
Lake States.....	10. 8	12. 1	+12. 7
Corn Belt.....	38. 9	44. 0	+13. 1
Appalachian.....	16. 2	17. 0	+5. 2
Southeast.....	19. 9	18. 6	-6. 8
Mississippi Delta.....	15. 8	14. 7	-7. 5
Southern Plains.....	28. 5	29. 9	+5. 0
Northern Plains.....	21. 3	23. 3	+9. 5
Mountain.....	5. 5	5. 8	+4. 0
Pacific.....	2. 2	2. 7	+22. 7
United States.....	163. 0	172. 0	+5. 6

<sup>1</sup> Ibach, D. B. Cropland Use and Soil Fertility Practice in War and Peace. (12, p. 54).

<sup>2</sup> Regions by groups of States as given in fig., 3.

tabulation, lands owned by Indians and administered or held in trust by the Federal Government are included with publicly owned lands.

From 1920 to 1930, the net change was away from public ownership to private ownership. About 40 million acres in homesteads were taken up. Practically all the remaining available Federally owned land suitable for any type of crop farming without expensive public improvements had passed into private ownership by 1930. Even much land ill-suited to arable farming was homesteaded. Public reservations for forests, parks, and other special use areas were growing but not enough to offset the disposal of public lands (table 20).

From 1930 to 1940, the upward trend in private ownership was reversed. During the depression 1930 to 1935, States and counties were unwillingly acquiring title to millions of acres through reversion, because of nonpayment of taxes and default in payments on farm loans and contracts for State lands. There was renewed interest about this time in public purchase of submarginal farms, abandoned farms, and cut-over woodland for restoration to grazing and forests and watershed and wildlife uses. Purchases for public purposes—as water supply areas, flood control, irrigation and power reservoirs, parks, and highways—all added to the land in public ownership. Although more than 1 million acres of homestead entries were perfected yearly, public acquisition of land through tax forfeiture and purchase greatly exceeded public disposals of land.

Beginning about 1938, or shortly thereafter, much of the State- and county-owned land, especially tax-reverted and foreclosed land, was sold to private parties. About 8 million acres of Federally owned land were homesteaded (homesteads perfected) during the period 1935-39. These reductions in public holdings were mainly nonforested

TABLE 20.—*Estimates of trends in land ownership, United States, 1920, 1930, 1940, and 1945*<sup>1</sup>

Land use	Private <sup>2</sup>				Public <sup>3</sup>			
	1920	1930	1940	1945	1920	1930	1940 <sup>4</sup>	1945 <sup>4</sup>
	Mil. acres	Mil. acres	Mil. acres	Mil. acres	Mil. acres	Mil. acres	Mil. acres	Mil. acres
Cropland <sup>5</sup> -----	398	409	396	398	4	4	3	5
Pasture and range land (nonforested)-----	440	434	476	455	310	274	247	252
Forest and woodland-----	407	431	393	402	160	176	209	200
Special-use areas <sup>6</sup> -----	22	23	26	27	29	41	51	73
Miscellaneous other land <sup>7</sup> -----	72	62	62	63	63	51	42	30
Total <sup>8</sup> -----	1, 339	1, 359	1, 353	1, 345	566	546	552	560

<sup>1</sup> Compiled from various sources, including State and Federal publications and records and reports of numerous State agencies. Total figures should be regarded as approximations of the acreages of land held by private parties and public groups and in different major uses rather than results of detailed enumeration.

<sup>2</sup> Private land includes all land owned by individuals, private groups, and corporations. It includes the major part of the farm land and the urban and residential areas of the country.

<sup>3</sup> Public land includes Federal, State, county, municipal, and Indian land under administration of the Government. The Indian land comprised nearly 57 million acres in 1945. Considerable acreages of public land are included in farms and ranches or used with them for grazing but most of the public land is not suitable for arable farming.

<sup>4</sup> Data on public land for 1940 and 1945 are preliminary as assembly and publication of data on public land use and ownership was deferred by various public agencies during the war.

<sup>5</sup> The greater part of the cropland reported in public ownership is Indian land and State school and other land leased out to farmers for farming.

<sup>6</sup> Towns, cities, farmsteads, highways, roads, parks, wildlife refuges, water supply areas, military lands, etc.

<sup>7</sup> Land chiefly of low value for agriculture.

<sup>8</sup> Individual items adjusted to total.

pasture and range land and were more than offset by increases in publicly owned forest lands.

The upward trend in public ownership continued in the period 1940-45. The acreage of homesteads perfected was at a low annual level relative to earlier years and was more than offset by the purchase of more than 7 million acres by the War and Navy Departments and by other miscellaneous public acquisitions. Dispositions by the General Land Office (homestead, desert and stone land, mineral entries, sales and exchanges) and liquidation of Farm Security Administration (now Farmers' Home Administration) projects under mandate of Congress totaled more than 2 million acres. Small net additions were made to national park, Indian, and national forest lands. It should be noted that considerable acreages of land acquired for military purposes from private owners has been sold, as declared surplus.

At present, nearly all the cropland and about two-thirds of the pasture and grazing is privately owned. Only about 1 percent of the cropland is publicly owned and this is mostly Indian land. More than one-third of the grazing is public land, either State, Federal, or



local government land. Most of this public grazing land is in the Western States and is arid, high in elevation, or rough, and only suitable for grazing part of the year. About one-third of the forest land is in some form of public ownership and two-thirds in private. "Special use areas" are composed largely of highway and road rights-of-way, parks, and other public-use tracts, and are about three-fourths in public ownership. Other lands generally of low agricultural value are two-thirds privately owned and one-third publicly owned (table 21, fig. 10).

TABLE 21.—*Private and public land ownership, by major uses, 1945*<sup>1</sup>

Land uses	Private land		Public land		Total	
	Acre-age	Per-cent-age of total	Acre-age	Per-cent-age of total	Acre-age	Per-cent-age of total
	<i>Million Acres</i>	<i>Per-cent</i>	<i>Million Acres</i>	<i>Per-cent</i>	<i>Million Acres</i>	<i>Per-cent</i>
Cropland.....	398	98. 8	5	1. 2	403	100. 0
Pasture and range land (non-forested).....	455	64. 4	252	35. 6	707	100. 0
Forest and woodland <sup>2</sup> .....	402	66. 8	200	33. 2	602	100. 0
Special use areas <sup>3</sup> .....	27	26. 3	73	73. 7	100	100. 0
Miscellaneous other land <sup>4</sup> .....	63	68. 1	30	31. 9	93	100. 0
Total <sup>5</sup> .....	1, 345	70. 6	560	29. 4	1, 905	100. 0

<sup>1</sup> REUSS, L. A., and McCracken, O. O. FEDERAL RURAL LANDS. Also, unpublished data on State and local government lands, BAE, 1947; JOHNSON, V. WEBSTER. STATUS OF FEDERAL LAND. (17, 20)

<sup>2</sup> About 22 million acres of forest and woodland areas are included in special-use and other areas.

<sup>3</sup> Urban areas; farmsteads; road, highway, and railroad rights-of-way; parks; military lands; public watershed and flood control; power and reclamation sites. The chief special-use areas in private lands are in farmsteads, urban areas, and railroad rights-of-way. All highway and public road rights-of-way in farms have been included in public land.

<sup>4</sup> Land generally having slight surface value for agriculture in farms and outside farms.

<sup>5</sup> For more details on total land area by major uses, see Appendix tables.

#### LAND DEVELOPMENT AND IMPROVEMENT

The rate of increase of land in farms has been lower since 1900 than before. In the 40-year period 1860 to 1900, land reported in farms more than doubled, whereas in the 45-year period 1900 to 1945 it increased only a little over one-third. Cropland harvested slipped back between 1920 and 1940. In some regions the cropland was larger before 1900. One reason has been the decline in undeveloped land available for settlement that could be converted into productive farms at reasonable cost. There is still, however, much undeveloped land within farms.

Development of land by clearing of forests and by drainage and

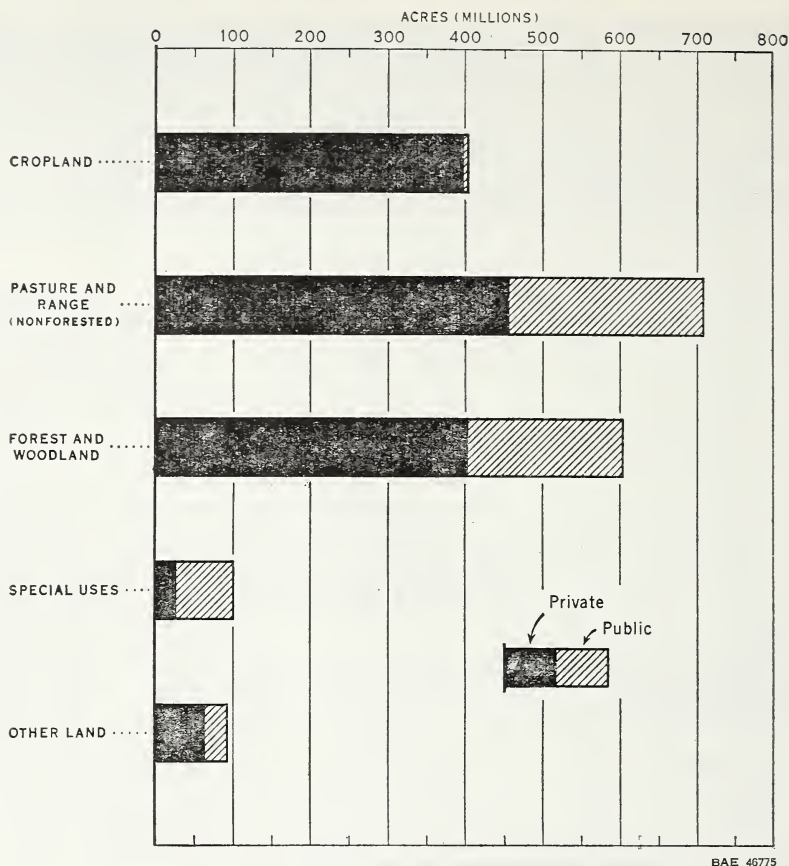


FIGURE 10.—LAND OWNERSHIP: PRIVATE AND PUBLIC.

Nearly all cropland is privately owned; only small areas are in special publicly owned areas, as some State, school, and Indian lands, and the lands held temporarily for some public purpose. About a third of the grazing and forest lands are publicly owned; much is in arid and mountain areas not well adapted to full-time agricultural use.

Irrigation has been going on for many years since settlement in fact, as has the counter movement of change of agricultural lands through conversion of cropland to pasture and reversion of agricultural land to woodland in some places. Agricultural development and agricultural abandonment both have proceeded from east to west, with the earliest major agricultural development and the earliest major agricultural abandonment taking place in the Eastern States. Available statistics do not permit an exact measurement of these trends but data concerning trends in land clearing, drainage, and irrigation, and the extent of forested and agricultural lands are of interest.

#### LAND CLEARING AND REVERSION OF CLEARED LAND TO FOREST AND WOODLAND

Clearing land from forest was an important process in developing farms in the originally forested counties. New ventures in land clear-

ing and settlement, whether by individuals or as community enterprises, probably will take place as long as there is undeveloped land that holds reasonable promise of supporting the operator at a reasonable level of living. But opportunities of this kind are more and more restricted. Although the present forest area is about one-third of the total area of the country, a large proportion is rocky, hilly, and mountainous; another large part is inadequately drained; and much of the smoother, well-drained land has soils too poor to be considered as potential farm land. In fact, the selective process of clearing and reversion to trees has advanced to the point that the greater part of the present forests must be considered now as coming close to economic marginality for competitive crop production, with average prices and average needs for agricultural land.

The conversion of forest and cut-over land into productive farms is a slow process, and in the past has frequently taken the labor of more than one generation. To succeed, a settler needs considerable initial financial resources, or during the first years he must obtain the greater part of his annual income from work off the farm, or must live very meagerly. Clearing land on a commercial basis is costly. Estimates of the cost of clearing vary considerably; they may be as low as \$20 to \$30 an acre in some parts of the South for cutting trees and burning brush without stumping, and may exceed \$200 for clearing and stumping in the heavy forests of the Pacific Northwest. Like the range in cost, the ways of clearing are variable in all regions, depending upon the land to be cleared, character of forest growth, and resources of the operator.

Clearing of forests to make room for new homes and farms has been continuous from the time the first white settlers landed on the Atlantic Coast. Some fields in the East have been cleared and cultivated for a time, then allowed to revert to forest, only to be cleared again at a later date and the cycle repeated. Expansion of agriculture through the clearing of the forest in one place is partly offset by the return to forest of abandoned farm land in other places. Clearing occurs not only in connection with new settlements and new farms but also in connection with enlargements of pasture and cropland on existing farms.

To reclear of brush and young trees, land that has once been cultivated, often is less expensive in labor and materials than to clear the original heavy forest. Consequently, much land left out of cultivation for a few years and allowed to grow up again in brush and saplings is recleared when more land is needed and farming appears to be profitable. Considerable acreages now in young growth will probably be cleared again for farming within the next decade.

Specific information concerning timber clearing and its counter-movement—reversion of cleared land to forests—is available only for limited areas and for short periods.

Estimates of change in the acreage of timberland do not reveal the true picture because land cleared in one period may revert to forest and then be cleared again at a later time. Furthermore, surveys of the acreage and character of forest land have been improved with the years, through expansion of the surveys to include larger sample areas and through refinement in classification of land. These im-



provements make recent estimates of the acreage of timberland superior to and not strictly comparable with earlier estimates.

Statistics concerning the acreage of improved or cleared agricultural land in farms (land in farms minus farm woodland) are indicative of trends in timber clearing and reversion of cleared land only in a general way, for only net changes in the acreage of cleared agricultural land are shown. For example, declines in a region or part of a region or part of a county which are offset by increases in another vicinity are not shown.

The original forested area (exclusive of arid woodland), such as, piñon-juniper and chaparral has been estimated at 820 million acres (11, pp. 83, 88; 19, p. 9). Before 1850, large-scale farm settlement was made almost entirely in the forested part of the East, outside of a few areas in scattered locations on the prairies and in the far West. The land cleared and improved has been estimated at about 25 million acres in 1790 and 113 million acres in 1850 (3, p. 60). By 1880, about 150 million acres of the original eastern forest had been cleared for farms and the bulk of the timber destroyed because there was no market (11, pp. 85-86). Before 1880, land clearing for agriculture outstripped lumbering. Since then, growing demand for lumber has caused land to be logged off more rapidly than it was taken up for farming. Total land clearing is estimated at 350 to 375 million acres. Some 25 million acres of this is used for such things as roads and cities. From 50 to 75 million acres of formerly cleared land has reverted to forest or brush (2, p. 21).

NEW ENGLAND.—The area of cleared agricultural land in New England probably was at its highest level about 1850 or 1860. The census and land records show that since about 1880 it has declined steadily. Early expansion of agriculture and clearing of forests were followed by strong competition from more productive lands opening up in the West, the rise of manufacturing and urban development and the resultant opportunities for employment on new western lands and in industry. (See tables 22 to 25 and fig. 11.) In 1945 the area in farms was only 67 percent as great as in 1880. The proportion of land in farms used for crops was about the same as in 1880 but the proportion in woods was much higher and the proportion in open pasture and other uses was much lower. Although net increases in agricultural land occurred in some counties in most decades, they were small in comparison with the net decreases in other counties.

MIDDLE ATLANTIC <sup>11</sup>.—The area of improved agricultural land in the Middle Atlantic region changed very little from 1880 to 1910. Although the opening of new land and industrial employment encouraged abandonment of poor-land farms, new land was being developed here as well as in other parts of the country. The acreage of land in farms and of agricultural land declined rapidly after 1910. In 1945, land in farms was nearly 20 percent less than in 1880, most of the decline coming after 1910. The proportion of land in farms that had woods decreased; that in crops remained about the same; and the proportion in open pasture and other uses increased. Net increases in agricultural land in some counties were much smaller than the net decreases in other counties.

<sup>11</sup> Includes the States of New York, Pennsylvania, New Jersey, Maryland, and Delaware.

TABLE 22.—All land in farms, by regions, originally forested counties east of Great Plains, specified years, 1880-1945<sup>1</sup>

Region	1880	1890	1900	1910	1920	1930	1940	1945
	<i>1,000 acres</i>	<i>1,000 acres</i>	<i>1,000 acres</i>	<i>1,000 acres</i>	<i>1,000 acres</i>	<i>1,000 acres</i>	<i>1,000 acres</i>	<i>1,000 acres</i>
New England.....	21,484	19,756	20,549	19,715	16,991	14,283	13,371	14,497
Middle Atlantic.....	52,712	48,996	51,096	49,287	46,275	40,322	38,732	39,529
Lake States.....	32,381	35,678	43,688	47,508	50,165	48,182	50,909	52,224
North Central.....	119,680	119,823	126,276	125,641	123,482	114,878	117,221	116,431
South.....	153,346	157,889	170,203	178,576	174,107	158,509	172,556	177,108
Total.....	379,603	382,142	411,817	420,717	411,020	376,174	392,789	399,789

<sup>1</sup> Prairie counties in Illinois, Iowa, Minnesota, Arkansas, Louisiana, Oklahoma, and Texas not included.TABLE 23.—Cleared agricultural land in farms<sup>1</sup>, by regions, originally forested counties east of Great Plains, specified years, 1880-1945

Region	1880	<sup>2</sup> 1890	<sup>2</sup> 1900	1910	1920	1930	1940	1945
	<i>1,000 acres</i>	<i>1,000 acres</i>	<i>1,000 acres</i>	<i>1,000 acres</i>	<i>1,000 acres</i>	<i>1,000 acres</i>	<i>1,000 acres</i>	<i>1,000 acres</i>
New England.....	14,168	-----	-----	11,862	9,970	7,883	8,225	7,565
Middle Atlantic.....	39,085	-----	-----	38,311	36,066	31,629	30,982	30,962
Lake States.....	22,084	-----	-----	36,670	38,639	36,074	42,063	40,262
North Central.....	70,865	-----	-----	91,556	92,486	88,937	92,877	1,382
South.....	65,635	-----	-----	96,448	102,256	100,998	110,085	109,039
Total.....	211,837	-----	-----	274,847	279,417	265,521	284,232	279,210

<sup>1</sup> All land in farms minus woodland in farms. Agricultural land as thus defined includes all cropland, all plowable and other nonforest pasture, and the area in farmsteads, roads, and other land in farms, with the exception of woodland. It contains possibly 2 percent of other miscellaneous land of low value for agriculture. Data are from Sen. Doc. 12 (42, p. 154) and from unpublished tabulations of BAE based largely on the census reports.<sup>2</sup> The censuses of 1890 and 1900 collected no information on the woodland in farms.

TABLE 24.—*Approximate acreage of crops harvested, by regions, originally forested counties east of Great Plains, specified years 1879-1944*<sup>1</sup>

Region	1879	1889	1899	1909	1919	1929 <sup>2</sup>	1939 <sup>2</sup>	1944 <sup>2</sup>
	<i>1,000 acres</i>	<i>1,000 acres</i>	<i>1,000 acres</i>	<i>1,000 acres</i>	<i>1,000 acres</i>	<i>1,000 acres</i>	<i>1,000 acres</i>	<i>1,000 acres</i>
New England.....	5,929	5,064	5,194	4,967	4,561	3,659	3,408	3,987
Middle Atlantic.....	21,829	22,274	22,142	20,845	20,718	16,474	15,446	16,604
Lake States.....	12,556	15,463	18,789	19,965	22,893	21,257	22,002	23,136
North Central.....	40,344	45,370	50,467	49,902	52,943	43,408	42,208	44,947
South.....	39,177	45,031	53,040	58,380	66,039	58,588	58,106	52,673
Total.....	119,835	133,202	149,632	154,059	167,154	143,386	141,170	141,347

<sup>1</sup>Schedules used and crops included were not exactly the same for each census. Data given are not always strictly comparable. Census of 1930 and later years was somewhat more inclusive than the earlier ones. Senate Doc. 12 (42, p. 154), and unpublished tabulations of BAE.

<sup>2</sup>Cropland harvested.



TABLE 25.—*Changes in cleared agricultural land, by regions, originally forested counties east of Great Plains, specified years 1910-45*

Region	Changes in agricultural land <sup>1</sup>							
	1910-20		1920-30		1930-40		1940-45	
	Gross increase	Gross decrease	Gross increase	Gross decrease	Gross increase	Gross decrease	Gross increase	Gross decrease
New England.....	1,000 acres 56	1,000 acres 1,948	1,000 acres 5	1,000 acres 2,092	1,000 acres 534	1,000 acres 192	1,000 acres 128	1,000 acres 788
Middle Atlantic.....	61	2,366	-----	4,437	389	1,036	719	739
Lake States.....	2,644	675	448	3,013	6,011	22	305	2,106
North Central.....	2,685	1,755	1,382	4,931	4,787	847	1,763	3,258
South.....	9,673	3,865	5,367	6,459	11,868	2,781	5,806	6,852
Total.....	15,119	10,549	7,202	20,932	23,589	4,878	8,721	13,743

<sup>1</sup> Gross increase is total of increases in counties having increases and gross decrease is total of decreases in counties having decreases during the period. Senate Doc. 12 (42, p. 155), and unpublished tabulations of BAE.

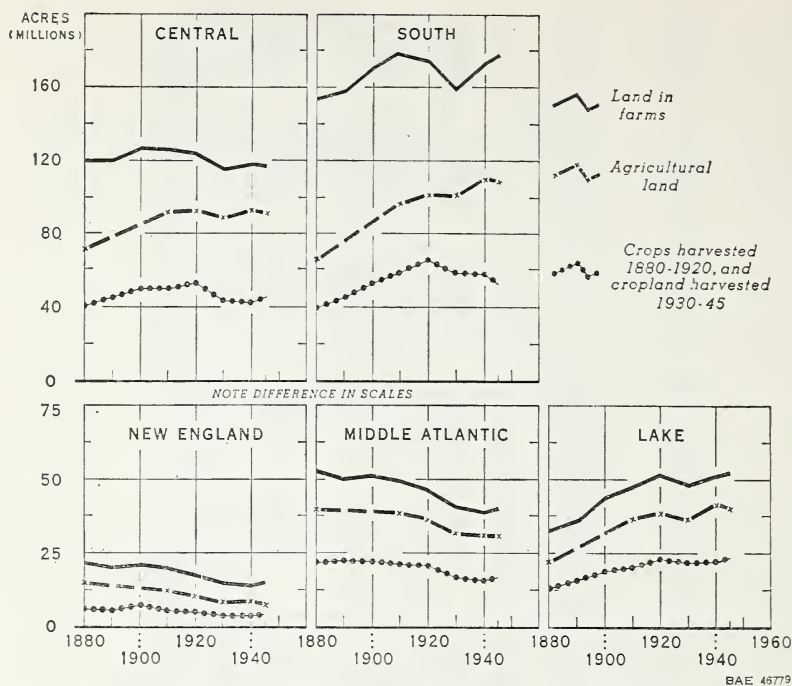


FIGURE 11.—AGRICULTURAL LAND, 1880-1945. ORIGINALLY FORESTED COUNTIES EAST OF GREAT PLAINS

Land in farms, agricultural land or improved land, and crops harvested declined decidedly in the 65 years, 1880-1945, in the New England and Middle Atlantic States. The downward trend now appears to be checked, as there was an increase from 1940 to 1945. The originally forested parts of the North Central and Lake States showed consistent increases in land used for agriculture from 1880 to 1920. Some parts of the South, as the Mississippi Delta, have had large increases in area used for farming because of clearing and drainage of new land and plowing grassland in Texas, but other areas in the Piedmont and hill country of Virginia, Georgia, and Mississippi have let large tracts of cropland revert to forest.

**LAKE STATES**<sup>12</sup>.—Agricultural development is more recent in the Lake States, with marked expansion of acreage in farms and acreage of agricultural land from 1880 to 1920. The acreage in farms in the originally forested counties was only slightly higher in 1940 than in 1920 and increased slightly from 1940 to 1945. Cropland acreage has declined in some areas. In others it has increased. Cleared agricultural land in 1945 for the whole region was about 4 percent greater than in 1920. A smaller proportion of the land in farms is woodland now and larger proportions are used for crops, pasture, and other purposes.

**NORTH CENTRAL**<sup>13</sup>.—Land in farms, cleared or nonforested agricultural land, and cropland acreages increased rapidly from 1880 to 1920 in the originally forested counties of the Central region. From

<sup>12</sup> Includes the originally forested counties in Michigan, Wisconsin, and Minnesota.

<sup>13</sup> Includes the originally forested counties in Ohio, West Virginia, Kentucky, Tennessee, Indiana, Illinois, and Iowa.

1920 to 1945, there were periods of decline and of increase but land in farms and cropland acreages tended to decline and the acreage of agricultural land remained about the same. In 1945, the acreage of land in farms was substantially below that of 1880, the acreage of agricultural land was about the same as in 1910, and the cropland acreage was about the same as in 1890. Decreases in land in farms and in cropland have been especially marked in West Virginia, southeastern Ohio, parts of Kentucky and Tennessee, and in the southern parts of Illinois and Indiana. For the region as a whole, the proportion of the land in farms classed as forest and woodland has declined steadily during the period for which we have records and the proportion of pasture and other noncrop land has steadily increased.

**SOUTH**<sup>14</sup>.—The acreage of cleared agricultural land in the originally forested counties of the South reached a peak in 1940 at a figure about 8 percent above 1920, but the reported acreage in farms was below the figure reached in 1910, and the cropland was about the same as in 1910. In this region the proportion of the acreage in farms which was classed as forest or woodland declined, and the proportion in pasture and other noncrop uses increased over the period of record.

Forest surveys in the South, 1932-40, reveal the acreage of "new cropland" (that is, land cleared of forest within 5 years before the time of the survey) and so indicate the areas of major development by forest clearing at that time (table 26 and fig. 12). These surveys also show the acreage of "abandoned cropland" (table 26). The surveys covered a gross area of nearly 283 million acres. New cropland exceeded 2 million acres and was found especially in the Mississippi River Delta of Arkansas, Louisiana, and Mississippi. Development of new farms, additions to old farms by clearing and drainage, and construction of many new rural homes in 1946 to 1948 by returning veterans and others, since the surveys were made, may have increased the rate of new cropland development in the last few years. Abandoned cropland shown by the surveys reached 5 million acres and was particularly high in northeastern Mississippi and was somewhat notable in north-central Georgia and Piedmont Virginia. Considerable abandoned cropland was found in all the areas surveyed, even including the Mississippi Delta area.

In some parts of the South new cropland development about balances cropland abandonment, while in other parts abandonment is much greater than clearing. In the North Carolina Piedmont, for example, the Forest Survey found that about 128,000 acres of new cropland were developed in a 5-year period between 1930 and 1940, or 1.2 percent of the area, while around 121,000 acres, or 1.1 percent, were abandoned. The south coastal plain of North Carolina had a rate of new cropland development considerably greater than abandonment. In the Georgia Piedmont and the hilly part of north Mississippi cropland abandonment was 4 to 5 percent of the land area.

#### DRAINAGE

From the beginning of settlement wet lands have been an obstacle to the development of the country. Drainage improvements were found

<sup>14</sup>Originally forested counties in Virginia, North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Arkansas, Louisiana, Oklahoma, and Texas.



TABLE 26.—*New cropland and abandoned cropland reported in forest surveys of portions of the South, 1932-40*<sup>1</sup>

State or portion thereof	Dates of surveys	Area surveyed	New cropland cleared within 5 years prior to survey	Abandoned cropland
Mississippi (excludes southeast Mississippi) ..	1932-34	<i>Acres</i> 23, 362, 200	<i>Acres</i> 355, 800	<i>Acres</i> 1, 176, 800
Arkansas (excluding northwest Arkansas, including southeast Missouri) ..	1934-36	26, 331, 500	317, 500	398, 400
Louisiana and southeast Mississippi ..	1933-36	35, 369, 400	300, 600	301, 500
North Carolina ..	1937-38	31, 193, 600	267, 300	326, 800
Alabama ..	1934-36	32, 692, 700	256, 800	669, 200
East Texas ..	1934-35, 1937	30, 177, 600	200, 400	254, 000
Virginia ..	1940	25, 535, 400	121, 100	380, 100
Georgia ..	1934-36	37, 584, 000	107, 800	974, 300
South Carolina ..	1936	19, 425, 600	57, 400	551, 800
Southeast Oklahoma ..	1936	4, 026, 200	26, 300	62, 900
Northern Florida ..	1934	17, 065, 600	15, 200	202, 800
Total ..		282, 763, 800	2, 026, 200	5, 298, 600

<sup>1</sup> Southern Forest Experiment Station, New Orleans, La., Forest Survey Release Nos. 11, 18, 21, 24, 31-33, 35-37, 40, 42, 43, 46-50, and 53 (46); Appalachian Forest Experiment Station, Asheville, N. C., Forest Survey Release Nos. 4-7, 11-13, and 15 (45) and U. S. Dept. Agr. Misc. Pubs. 309, 313, 326, 501, 533, and 552 (52, 13, 7, 23, 8, 9).

necessary by many of the landowners on the Atlantic Coast during colonial times. Since then, drainage activities have continued and expanded, so that run-off outlets now have been provided and improved for more than 100 million acres, although not all of this can be considered as adequately drained.

Enterprises with artificial drainage can be divided readily into two main groups on the basis of organization. One is the community enterprise and the other is the individual enterprise.

Drainage districts, county drains, and township drains are community enterprises organized under general or special State laws for obtaining cooperation between landowners who will be benefited by drainage works. Local district drainage enterprises are managed by officials elected or designated for that purpose. State projects usually are administered by State officials. Individual enterprises include one or more farmers cooperating, without organization, to build and maintain farm-drainage structures.

The drainage process in the individual enterprise is frequently confined to a single farm. Here procedure depends entirely on the initiative and responsibility of the farmer who undertakes to improve the drainage of his land. Field ditching and tile draining are mostly of this type. There are no exact figures available that indicate the extent of land drained on farms outside of drainage districts, but from older

census reports it seems certain that at least between 40 and 50 million acres have been improved in this way.

Community drainage ditches are necessary to provide several land-owners with a common drainage outlet for poorly drained land. Such drainage usually may be provided by the organization of drainage districts regulated and operated under the provisions of State laws. These laws confer legal power and responsibility on the drainage districts for constructing ditches and operating them, and for assessing,

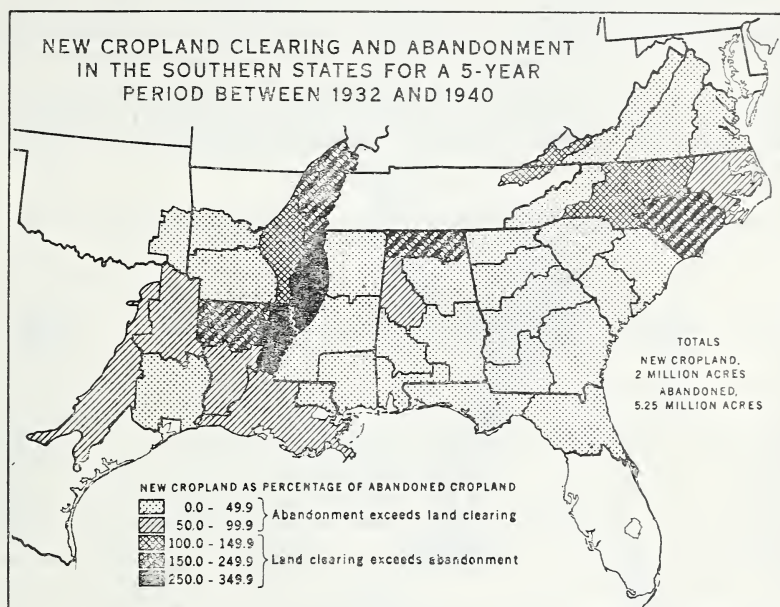


FIGURE 12.—New land clearing is not of the past. It is continuous, the rate of clearing and other development fluctuating with economic conditions. Most of the current development is unspectacular, and on existing farms. The highest rate of clearing in the South is in the Mississippi Delta of Louisiana, Mississippi, and Arkansas. In a 5-year period in the 1930's it amounted to 2 to 3 percent of the land, but much has been done since the war. In some parts of the Piedmont and other parts of the South new cropland development about balances or only slightly exceeds cropland abandonment; in other parts abandonment of poor or severely eroded land is much greater than clearing. (The rate of clearing woodland for the 5-year period is expressed as a percentage of the land abandonment. Refer to table 26 for sources of data.)

collecting, and paying the cost of drainage and maintenance. The costs of construction and maintenance are distributed among the land-owners of the district in proportion to benefits derived. According to the 1940 Census, nearly 87 million acres had been organized into 39,597 drainage districts under these laws. In addition, drainage of about 600,000 acres had been undertaken by the States themselves, and nearly 2 million acres were included in Federal enterprises. Of the total, about 50 million acres were usually used for crops.

For the country as a whole, there were major increases in area in organized drainage districts during the period 1905-24 (table 27).

In 1940, about 44 percent of the improved land in organized drainage enterprises was in the Corn Belt, 25 percent in the Lake States, 11 percent in the Mississippi Delta States, and 8 percent in the 11 Western States (table 28, fig. 13). The increase in improved land in drainage enterprises naturally lagged behind the organization of enterprises. From 1920 to 1930, the increase in improved land was great in all regions, with the larger relative increases in the Corn Belt, the 11 Western States and in the Appalachian and Southeast regions. Development was less rapid from 1930 to 1940 in all regions. However, the larger relative increases were recorded in the Southern Plains, the 11 Western States, and the Appalachian, Southeastern, and Mississippi Delta States. The acreage in the Corn Belt actually declined as a result of decreases in the acreage of improved land in drainage enterprises in Indiana and Ohio. In other regions, 8 States showed declines from 1930 to 1940: Wisconsin, Kentucky, Mississippi, Florida, South Dakota, Arizona, Utah, and Nevada.

TABLE 27.—*Area in drainage enterprises, by year of organization, United States, 1870-1939*<sup>1</sup>

Date of organization	Land in enterprises	Date of organization	Land in enterprises
	<i>1,000 acres</i>		<i>1,000 acres</i>
Before 1870-----	171	1915-19-----	18, 012
1870-79-----	428	1920-24-----	11, 272
1880-89-----	2, 429	1925-29-----	7, 411
1890-99-----	3, 743	1930-34-----	2, 093
1900-04-----	6, 769	1935-39-----	3, 874
1905-10-----	12, 192		
1911-14-----	19, 573	Total-----	86, 967

<sup>1</sup> Statistical Abstract of the United States, 1946.

TABLE 28.—*Improved land in drainage enterprises, specified years, 1920 to 1940*<sup>1</sup>

Region	1920	1930	1940	Change 1920-30	Change 1930-40	Change 1920-40
	<i>1,000 acres</i>	<i>1,000 acres</i>	<i>1,000 acres</i>	<i>1,000 acres</i>	<i>1,000 acres</i>	<i>1,000 acres</i>
United States-----	44, 288	62, 514	67, 389	18, 226	4, 875	23, 101
Western States-----	1, 760	4, 188	5, 430	2, 428	1, 242	3, 670
Northern Plains-----	1, 844	2, 819	3, 134	975	315	1, 290
Southern Plains-----	1, 116	2, 154	2, 884	1, 038	730	1, 768
Corn Belt-----	23, 813	29, 982	29, 428	6, 169	554	5, 615
Lake States-----	11, 255	15, 592	16, 547	4, 337	955	5, 292
Mississippi Delta-----	3, 702	5, 833	7, 462	2, 131	1, 629	3, 760
Appalachian and Southeast (except West Virginia)----	798	1, 946	2, 504	+1, 148	+ 558	+1, 706

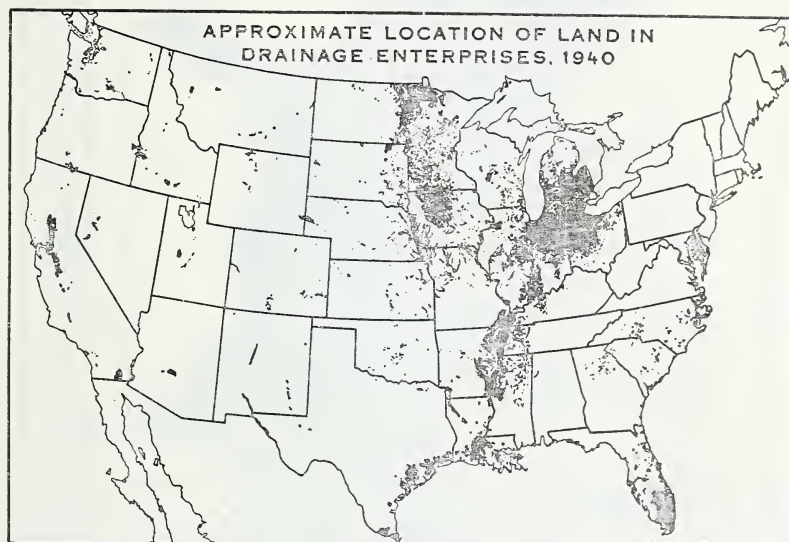
<sup>1</sup> The New England States, New York, New Jersey, Pennsylvania, and West Virginia were omitted in 1940.



The total increase from 1920 to 1940 in improved land within drainage enterprises was more than 23 million acres. Not all of this increase is new cropland, as certain areas were already used for crops even though subject to the hazards of overflow and ponding of waters.

#### IRRIGATION

There is a wide difference in the precipitation received in different parts of the United States. A zone of 18- to 20-inch precipitation extends in a general north-south direction from Texas to North Dakota in the proximity of the 100th meridian. Generally speaking, this zone divides the country into two regions—to the east there is adequate



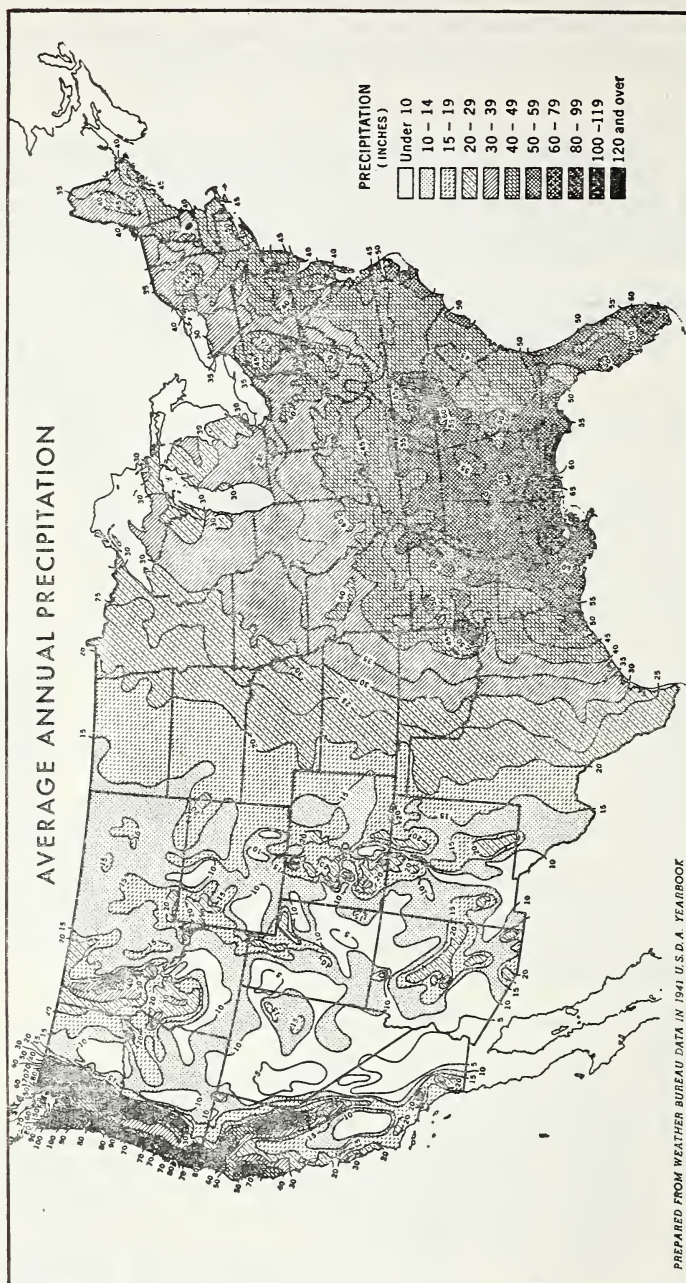
BAE 31274

FIGURE 13.—More than 87 million acres are included in organized drainage districts. About three-fourths, or 67 million acres, is improved land. Of the unimproved land, 4 million acres were classified by the 1940 Census as available, for settlement. From 40 to 50 million acres outside of organized districts have been improved by farm drainage.

rainfall for crop production and to the west there is deficient precipitation (fig. 14).

In most of the West, comprising about half of the United States, rainfall deficiency ranges from that in areas where crops cannot be grown without supplemental water to that in areas where crops can generally be grown but droughts cause uncertainty as to the size of harvest. These difficulties have been surmounted in many parts of the West by putting water from streams, lakes, and underground sources onto the land for crops (fig. 15).

Although some irrigation has been practiced in the West for more than 100 years, only relatively small acreages had been brought under irrigation by 1870. Nearly 4 million acres were irrigated in 1890 (in the 17 Western States and Arkansas and Louisiana). From 1890 to 1920, irrigation in these 19 States increased to 19 million acres. The



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**FIGURE 14.**—This map suggests why irrigation or drainage and flood control are especially necessary for agriculture in some regions. For example, the 20-inch precipitation line in the central Great Plains divides the country into eastern and western parts with marked differences in prevailing uses of land. However, the agricultural regions do not follow lines of equal precipitation but may cut across precipitation zones from northern to southern areas, where, because evaporation is greater, more rainfall is required for crops.

period of rapid expansion ended about 1920; after that more attention was given to furnishing additional water to land that was inadequately irrigated. Only about 2 million acres of new land were irrigated from 1920 to 1940 (table 29).

The total area irrigated from all sources of water in 1939 was approximately 21 million acres; the area reported entirely irrigated from streams was 16 million acres; the area reported as irrigated entirely from wells, either pumped or flowing, was 2.6 million acres, and the area reported irrigated from a combination of sources was 2.4 million acres. Available data on irrigation projects indicate that the area

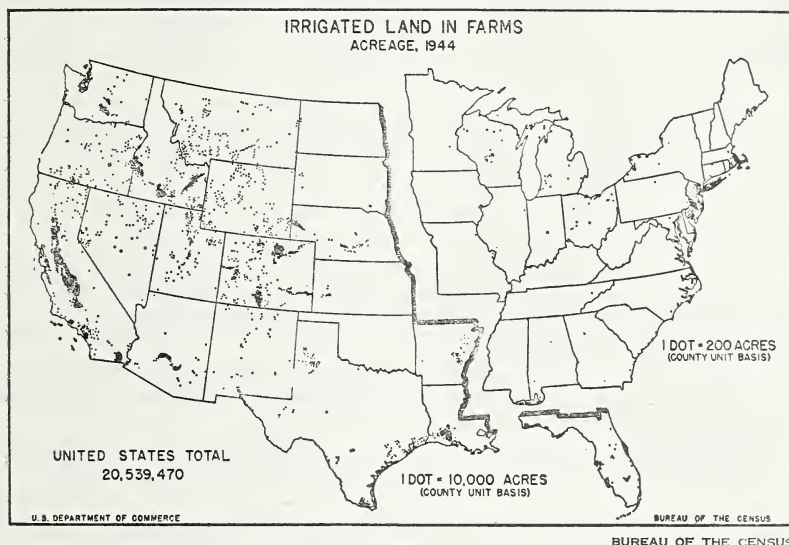


FIGURE 15.—Area of cropland harvested and pasture actually irrigated was about 20.3 million acres in 1944 in the 17 Western States and Arkansas and Louisiana. This does not include newly planted young crops, crop failure, and fallow and idle land under the ditch as in case of all land under irrigation. Several Western States have large areas of irrigated land. Many additions are in prospect, both in amounts and in locations of irrigated acreages, as new projects are developed in the drainage basins. Irrigation is increasing in the rice areas of the South and the Eastern truck-crop areas.

under all forms of irrigation in 1948 probably is in excess of 22 million acres.

The number of farms with irrigated land increased more rapidly than the area irrigated, and the average acreage irrigated per farm declined after 1910. In 1940, about 292,000 farms, or about 15 percent of all farms in the 19 States, had irrigated land, and the average irrigated acreage per reporting farm was 72 acres. Nearly one-fourth of the irrigated farms also included dry-farm cropland or pasture.

During early decades many projects of medium size with readily available water supplies were developed by individuals, small companies, and organized local districts. In the 1930's, governmental stimulus was given both to large, multiple-purpose projects and to small, pump-irrigation projects that often served individual farms



TABLE 29.—*Area under irrigation, 17 Western States and Arkansas and Louisiana, specified years, 1890 to 1940*

Year	Area under irrigation <sup>1</sup>	Number of farms with irrigated land <sup>2</sup>	Area irrigated crops harvested and pasture <sup>3</sup>
	<i>Acres</i>	<i>Number</i>	<i>Acres</i>
1945-----	<sup>4</sup> 21, 500, 000	-----	<sup>5</sup> 20, 312, 000
1940-----	21, 004, 000	291, 655	17, 817, 000
1930-----	19, 548, 000	265, 147	14, 633, 000
1920-----	19, 192, 000	222, 789	( <sup>6</sup> )
1910-----	14, 433, 000	162, 723	( <sup>6</sup> )
1900-----	<sup>7</sup> 7, 744, 000	113, 849	7, 744, 000
1890-----	<sup>7</sup> 3, 716, 000	54, 136	3, 716, 000

<sup>1</sup> All land irrigated or for which water was received, including crop and pasture land irrigated, land in young crops not harvested, crop failure, and land being fallowed or prepared for cultivation. From Sixteenth Census of the United States: 1940—Irrigation of Agricultural Lands (31).

<sup>2</sup> Farms reporting irrigated cropland harvested and/or irrigated pasture 1940 Census of Agriculture, (31) and farms reporting irrigated crops, 1930 (29), 1920 (30), and 1910 (32) censuses.

<sup>3</sup> Area of crops harvested and pasture irrigated. This area does not include newly planted young crops, fallow land, and other improved land having water rights and under the ditch as in the case of area under irrigation.

<sup>4</sup> Estimated total area under irrigation in 1945. The estimated area under irrigation in 1948 is 22 million acres.

<sup>5</sup> Acreage of crops and pasture irrigated in 1944. Excludes about 284,000 acres irrigated in the Eastern States other than Arkansas and Louisiana. From release of Farm Census 1947 (28).

<sup>6</sup> Not available.

<sup>7</sup> Area irrigated crops harvested and pasture; the area under irrigation not available.

alone. In 1940, there were 91,637 organized irrigation enterprises in all.

The Census of Irrigation in 1940 grouped all primary irrigation enterprises into six types, based on character of organization. These types of primary enterprises and the percentage of irrigated land supplied water directly were as follows: individual enterprises, 35 percent; cooperatives, 31 percent; irrigation districts, 17 percent; commercial, 5 percent; United States Bureau of Reclamation, 9 percent; and all others, 5 percent.

In addition to primary irrigation, there are many public and private enterprises that provide supplemental water to areas that have insufficient supplies. For example, the Bureau of Reclamation furnishes supplemental water to many areas in addition to those in its primary enterprises. Cooperatives, irrigation districts, and city, commercial, and individual enterprises also supply supplemental water to large acreages.

Individual and partnership enterprises usually belong to individual farmers or to two or three neighboring farmers. They mostly use small gravity diversions from streams or water pumped from wells. Cooperative enterprises are controlled by water users under some form of group organization. They provided much of the earliest irrigation in the Southwest.

Irrigation districts established under State laws serve large areas. Commercial enterprises also have been developed to supply water under contract to farmers who own no interest in the works. Other irrigation enterprises include those operated by the Office of Indian Affairs, by States under special laws, and by companies established to irrigate certain areas of public land granted the States in the arid region.

Since 1902, the Federal Government, through the Bureau of Reclamation, has been directly engaged in planning, constructing, and financing irrigation projects, including large multiple-purpose projects beyond private financial means. Technical assistance and credit for farm irrigation have been furnished to individual farmers and ranchers by State and Federal agencies. By 1945, about 21½ million acres had been brought under irrigation by the Federal Government's program. Another 1.7 million acres of irrigated land, that previously had inadequate water to irrigate crops fully, were being supplied with additional water by Government projects. Thus, Federal projects were furnishing water to 4.2 million acres, or one-fifth of the 20.3 million acres of cropland harvested and pasture irrigated in the Western States in 1945.

Farmers who receive water from Federal projects pay for the cost of operating and maintaining the irrigation works. They are also required to repay the cost of constructing the irrigation projects over a long term, usually 40 years. Receipts from the sale of public land and other public appropriations have provided funds for much initial construction. Certain public-land receipts are handled as a revolving fund for financing new projects.

A large part of the irrigated land is devoted to growing crops that are used largely for supplemental livestock feed. More than half of the irrigated acreage was given over to growing hay and pasture in 1939, the latest date for which individual crop acreages irrigated are available from the Census of Agriculture. In that year about 6½ million irrigated acres were devoted to hay and more than 2½ million acres to irrigated pasture. Alfalfa was the most important hay crop, and more than three-fourths of the acreage in the Western States was grown under irrigation. In addition, grain was grown on more than 5 million acres; much of this grain was used for livestock but it amounted to only 4 percent of the grain acreage of the 17 Western States and 8 percent of the total grain production in these States.

Climatic and other conditions make parts of the West especially well adapted to fruits, vegetables, and other specialty crops. More than 3 million acres of irrigated land were devoted to this intensive farming in 1939. In the Southwestern States and those bordering the Pacific Coast, nearly 1½ million acres were used for citrus fruits, apples, peaches, pears, and other tree fruits and nuts. About two-thirds of all the acreages of these crops in the West is irrigated. A large share of the total fruits, nuts, and vegetables, particularly winter vegetables, is produced in these States.

Sugar beets are an important crop and practically all of the western production is grown on irrigated land. Potatoes and dry beans are also important; about three-fourths of these crops in the Western States are grown under irrigation. Other notable crops produced under irrigation are rice, cotton, dry field peas, hops, grapes, and field seeds.

Thus, irrigation is an indispensable part of the western economy. It supplements the range livestock industry, and furnishes large supplies of specialty crops. Without it, much of this region would be very sparsely inhabited, with few sizable cities between the Pacific Coast and the 100th meridian. Particularly in the arid parts of the West, the irrigated farms furnish a very large part of the agricultural income aside from the livestock industry, and they form the basis for much of the nonagricultural development other than mining. In the semiarid parts, irrigation adds stability to the whole economy.

Although statistics for the States in the humid part of the country are not strictly comparable with those for the 17 Western States, the 1945 Census of Agriculture reports 284,000 acres of irrigated crops harvested in the Eastern States, exclusive of the rice and other irrigated farms of Arkansas and Louisiana. Irrigation in the humid areas is increasing. Much of the acreage irrigated in 1944 was located in Florida, New Jersey, and other truck-crop areas.

Looking to the future, about 100 Federal irrigation projects have been authorized by Congress and are in the picture for long-time reclamation development as funds are made available for construction and other necessary work. It has been estimated that these 100 newly authorized projects would provide for the irrigation of 6.3 million acres of new land in the 17 Western States and provide supplemental water for 4.3 million acres now under irrigation where present water supplies are inadequate.

#### SOURCES OF ADDITIONAL CROPLAND

One readily available source of additional land for crops is the conversion of plowable pasture to cropland. Also, the arable area might be increased from the productive, unimproved woodland, range land, and "other land" partly in farms and partly outside farms. This could be accomplished when increased demand justifies bringing it into production by clearing, draining, irrigation, and other improvements. There is probably more than 75 to 80 million acres of land which, when drained, irrigated, or cleared, would be more productive for crops than some cropland now in cultivation. Of this total, a considerable area would be fairly well adapted to cultivation by clearing alone, without drainage or irrigation, although for much of the land in the South draining would be requisite.

The Soil Conservation Service, in its classification of the lands of the country in 1945 according to use capability, classed approximately 80 to 100 million acres of unimproved land as suitable for regular cultivation under good practices. This includes the land that needs drainage, irrigation, and clearing, as well as some acreages of grazing lands suitable for cultivation under good farming practices. It has been estimated that about 40 million acres could be brought into cultivation, if needed, at feasible costs. Much of the remainder would require heavy expenditures and large-scale private and public projects to improve it enough for profitable cultivation.

The bulk of the 40 million acres of unimproved land most suitable for development is in areas where development projects—as drainage, flood control, and irrigation—are partly completed, or under construction, or authorized. Although these physical possibilities for de-



veloping new farm land exist, the creation of new-land farms and considerable additions to old farms is a long-time job (37, pp. 35-44). To place the new land in profitable production would require the completion of many public projects on which construction was delayed by the war; undertaking other projects; construction of necessary community facilities, farm buildings and other improvements; and carrying out the land-development work.

A considerable part of the development under way and planned is primarily to benefit existing farms and ranches, although other areas of undeveloped land will also benefit. Some of the major public improvements have been partially completed for several areas, including the Columbia Basin of Washington, the Central Valley of California, and several other western areas. Federal flood-control projects and local drainage projects have reduced flood hazards and improved drainage in the Mississippi Delta and a few other places. Flood-control projects, authorized and proposed, will further reduce floods in some areas and will benefit land that is suitable for farming. Much of the development throughout the country for drainage and cut-over areas, however, is primarily a matter for local districts and for community groups and individual initiative, as there is no Government program for it at present.

Only a few small, scattered areas of public-domain land in the Western States are suitable for farming. They are included in the estimate of land available and feasible for new settlement. Several of the projects planned for irrigation contain some public land, but the actual public land that appears feasible and profitable to develop into farms is limited. In most cases public projects will be necessary to carry out development. Only small acreages of public-domain land are now open to homesteading. They must be classified by the Bureau of Land Management as suitable for farm or ranch use before application for entry can be completed.

#### CUT-OVER LAND

Areas suitable for farming without drainage or irrigation consist largely of forest or woodland that needs clearing. It has been estimated that nearly 75 million acres of woodland are fairly well adapted to crop production if cleared alone or if cleared and drained, although the quality of the land generally is lower than the best of the present cropland. A large part of this land is now grazed. Possibly 10 million acres of the best grades of the woodland not needing drainage or irrigation could be developed at reasonable costs. The amount, species, and size of the forest growth on this land will affect the costs of clearing. The size, character, and species vary greatly. The method of clearing may appreciably affect the cost of bringing this land into cultivation.

#### IRRIGABLE LAND

Representatives of the Bureau of Reclamation have recently made estimates of the potential additional irrigable area. This estimate was made by summarizing the data from more than 400 projects authorized, planned, and proposed for consideration from time to time (36, pp. 88-90, 690-693, 1,086-1,088; 35, pp. 89-90). It appears that there is an ultimate total of around 22 million acres of new land

that could be added to cropland by irrigation; many relatively high-cost projects are included. Detailed investigations may show that some projects proposed are not feasible, or are too costly, or have less land suitable for irrigation than first approximations indicated. This figure compares with an area irrigated in 1940 of 21 million acres. The availability of water and the cost factors are important considerations in economic potentiality. A total of about 7 million acres of new land is in about 100 irrigation projects which are partly developed or authorized. Much of the land in the present irrigated areas needs additional water, and many of the new projects provide supplemental water for existing projects as well as water for new land and for land now being dry-farmed.

#### DRAINABLE LAND

The national agricultural plant is susceptible of substantial expansion through drainage. It has been estimated that about 31 million acres of partly improved land in farms can be improved for crop use, with proper drainage. But most of the wet land available for drainage is forest or cut-over land, and so requires clearing in addition to drainage, which will increase the cost of reclamation proportionally. According to the 1940 census of drainage enterprises, 4 million acres of unimproved land within drainage districts in the Eastern and Mississippi Valley States were listed as available for settlement.

Present information from Soil Conservation Surveys indicates there are about 21 million acres or more of unimproved land, suitable for farming and feasible of development, which could be supplied with drainage at reasonable cost (24. 1). Such lands are found in every State, but the bulk is found along the South Atlantic and Gulf Coasts and in the Mississippi Valley. Other areas are capable of producing crops if drained and otherwise improved, but the costs would be higher than in the past.

The distribution of wet land is mainly confined to the humid part of the country. Along the Atlantic seaboard and the Gulf coast are extensive low and level lands that have imperfect natural drainage. Very little of this land has been drained, and much of the large swamps (Dismal and Okefenoke), the tidal marshes, the lower Everglades, a large part of the flatwoods, and other areas of lesser extent must be regarded as not being economically feasible of reclamation under conditions of present costs and farm-land requirements. The broad lowlands bordering the larger rivers in the coastal plains, of which the alluvial valley of the Mississippi is outstanding, are subject to overflow and contain much poorly drained but fertile land. Reclamation depends in such cases on measures taken for flood protection, combined with drainage. In the glacial region of the North, the flat plains, depressions, and former glacial-lake bottoms add large areas of wet land. The need for drainage frequently becomes apparent as a result of irrigation, in the Western States. In many places irrigation without proper drainage brings alkali accumulations which, with increasing concentration, become too toxic for crops.

In general, as in land clearing and irrigation, the better and more easily drained lands were developed first. Those that remain are either not of high fertility or have some disability that makes their

utilization more difficult, such as high cost of protecting from overflow, heavy clearing, frequency of storms and tides. Despite these disadvantages, these lands constitute a valuable reserve of agricultural lands if it should be necessary to draw upon them.

#### LAND UNSUITED TO CULTIVATION

Land development or even the more intensive use of land cannot be considered entirely as net additions to arable farming. In many instances, land ill-suited to farming because of soil and slope is being farmed with only meager returns. Much land cultivated during the war cannot be permanently maintained in cultivation because of erosion, poor soil, climatic conditions, or lack of enough water. This will add to the problem of shift in use within the next 10 years. While land is being reclaimed by drainage, irrigation, clearing, and through the employment of soil-building practices, the fertility of other land is being exhausted through nonconservative farming. This land should be taken out of regular cultivated crop production and restored by erosion control, including revegetation measures.

Soil-conservation surveys indicate that at least 40,000,000 acres of poor land now used for cropping are not suitable for regular cultivation owing to severe erosion, steep slopes, and poor soil (5, pp. 63, 75-76; 4, pp. 164, 166; 49, pp. 4-13). So the acreage that may be desirably removed from cultivation is about the same as that which might be made available by developing new land. Need for retiring poor cropland to other more extensive uses may be one of the chief justifications for bringing into cultivation an equivalent productive acreage of new crop and pasture land.

So far as consumer demand under full employment can be met with fewer crop acres than are now in use, the retirement of 40 million acres of poor land over a period of years may be a good way to readjust land use to the new situation that may prevail after the demands of postwar relief are satisfied. It is possible that the new land in the Mississippi Delta, the Columbia Basin, the Central Valley of California, and other projects now being developed is ample to offset the 40 million acres that should be retired. Apparently, land may be brought into use faster than poor land can be retired either by private or public action.

#### LOCAL AND DISTRICT MEASURES TO ASSURE GOOD LAND USE

Considerable public attention has been directed toward the problems of land conservation and new land development, and in particular of resettling returning veterans. This renewed interest poses again, as it did after former wars, the question of whether public policy shall again encourage wholesale settlement of raw and undeveloped land in isolated localities or look forward to selective settlement and improvement of productive land in farming communities already established. This is a question of prime importance.

As land use is affected by public as well as by individual desires and actions, it may be worth while to review here some of the recent local measures that have been taken to assure good use of land. The complementary nature of land use for farms, forests, livestock ranges, rec-



reation, and watershed protection has been recognized in such activities as rural land use zoning ordinances, soil-conservation districts, grazing districts, and permits for grazing in the national forests.

#### EXTENT AND TYPES OF LAND ZONING ORDINANCES IN FORCE <sup>15</sup>

Thirty-four States have some form of land-zoning legislation. There are many differences as to type of zoning permitted, the purpose, and the areas covered. Most of the zoning has to do with industrial, commercial, residential, and highway rights-of-way areas, rather than directly with agriculture and other extensive rural land uses.

Two of the main types of zoning ordinances that have been enacted to protect land use in rural areas are (1) the forestry-recreational type and (2) the agricultural-industrial type. The purpose of the forestry-recreational type is to preserve the natural forest and recreational areas by forestalling settlement and year-round residence in isolated localities. In the agricultural-industrial type there is a greater diversity of districts and uses. The purpose is to regulate land uses outside incorporated cities and villages in order to keep them in harmony with land uses within the corporate limits.

Twelve of the 34 States that have enabling legislation with respect to zoning, have laws authorizing rural zoning in all counties; 10 additional States authorize zoning in specified counties; and 12 States authorize zoning by towns, townships, and special districts. In December 1946, approximately 150 counties and 460 townships had zoning ordinances in the States that have enabling legislation.

Only eight States, however, have counties with ordinances that contain specific rural land use zoning provisions. They are Wisconsin, Minnesota, Michigan, Tennessee, Colorado, Utah, California, and Washington. In all, 49 counties in these States have ordinances that deal with rural zoning.

According to the latest information available to the Bureau of Agricultural Economics, 35 counties in Wisconsin now have zoning ordinances, 7 of which are the agricultural-industrial type of zoning and 28 the forestry-recreational type. The forestry-recreational ordinances usually establish (1) forestry, (2) recreational, and (3) unrestricted districts. By use of zoning ordinances in conjunction with the State Forest Crop Law, approximately 5 million acres of forest land have been closed to agricultural development in northern and central Wisconsin. The trial of rural zoning in northern Wisconsin has been observed closely by other States, where costs of providing schools, roads, and relief to settlers scattered through the poor and remote areas were high.

#### SOIL CONSERVATION DISTRICTS <sup>16</sup>

At the close of 1947 more than 1,950 soil-conservation districts had been organized in the United States and its territories, covering more than a billion acres. They include more than 75 percent of our total number of farms and about 55 percent of the total land. Each month

<sup>15</sup> See Scott, L. M. *Rural Zoning in the United States* (21, pp. 30-32, 186-95).

<sup>16</sup> Data from Annual Report of the Chief of the Soil Conservation Service, 1947 (48) and records of SCS as of January 1, 1948.

farmers are organizing (January 1, 1948) about 20 new districts. Approximately 133 million acres have been added to districts through petition of surrounding farmers who ask to be included in districts.

Records of the Soil Conservation Service indicate that already more than 110 million acres of farm and ranch land are safeguarded and improved by conservation measures. The rate of conservation progress contributing to the total of protected land is now about 20 million acres a year.

Farm-conservation plans made under the soil-conservation district program include agreements on the part of farmers to use their land in accordance with its capabilities and to adopt the necessary conservation practices. Soil-conservation districts organized under State legislation help to provide technical assistance and information on proper land use and good conservation practices. Farmers must arrange for installation of measures at their own expense. In some instances, soil conservation districts have heavy equipment for drainage, terracing, filling gullies, and construction of farm ponds, which they can rent to farmers. The amount of such equipment is limited, and most of the work must be carried out by farmers or through contract.

The first soil-conservation district law was enacted by the Legislature of Arkansas in 1937—11 years ago. By the close of the 1945 State legislative sessions all States had adopted soil conservation district laws, with the single exception of Connecticut; its State legislature passed a conservation act in 1945, which permits cooperation by the United States Department of Agriculture in conservation work in much the same way as in other States (50, pp. 538-549).

The South, in general, where conservation needs were recognized as immediate, has led the rest of the country in the extent of territory organized into soil-conservation districts. Arkansas was the first State to pass a soil-conservation-district law, but North Carolina was the first in which a district was organized. Alabama was the first State completely covered by organized soil conservation districts. In 1946, 77 percent of all farms in the South were included in districts, compared with 43 percent outside the South.

#### GRAZING DISTRICTS

Grazing districts were established under authority of the Taylor Grazing Act of 1934. Fifty-eight districts, comprising a gross area of 265 million acres, of which about 142 million acres are administered under the program, are in operation. The lands administered within these grazing districts in 1945 comprised 132.4 million acres of vacant public land, and about 10 million acres of other lands administered under cooperative agreement with other agencies (40, pp. 285-289). This includes practically all unreserved and unappropriated land of value as well as some land held for special purposes. About 9 million head of livestock was authorized on the range by licenses or permits issued to stockmen in 1947; these were owned by nearly 21,000 operators or users.

The Taylor Grazing Act and amendments authorized the withdrawal of a maximum of 142 million acres of the public domain from homestead entry, and its organization as grazing districts to be administered by the Department of the Interior. Broad powers are con-

ferred by the act, to regulate and control the use of the range within the grazing districts, develop water resources, carry on conservation operations, and otherwise develop and improve the range. This legislation as amended also provides for the leasing, sale, or exchange of land required for Federal grazing districts and cooperative administration of intermingled State and private land. The Bureau of Land Management of the Department of the Interior administers the grazing-district program.

Most of the acreage, included within the outside boundaries of grazing districts, in addition to the 142 million acres directly administered, is State and privately owned land. Arrangements have been worked out in many instances for mutually advantageous grazing use, water, and land-improvement measures for the other range land in the districts. The Pierce Act permits lease and administration for grazing by the Federal Government of State, county, and private lands. Some reserved Federal lands are included for grazing, such as land in reclamation, power, and other special withdrawals.

In addition to the grazing districts, nearly 12 million acres in the unreserved, unappropriated public domain that are so situated as not to justify their inclusion in grazing districts were leased to stockmen in 1947 under section 15 of the Taylor Grazing Act.

Local grazing districts also have been organized by private land-owners and stockmen under State laws, notably in Montana, which have leased or obtained permits for use of Federal land, railroad, and other private land within their districts. Thus a fairly satisfactory working arrangement has been made for grazing and maintenance of intermingled types of ownership.

#### GRAZING PERMITS IN THE NATIONAL FORESTS

More than 80 million acres in the national forests are used for grazing under a system of permits to local farmers and ranchers. In 1946, nearly 19,000 ranchers and stockmen were issued pay permits for grazing their flocks and herds in the national forests. Nearly 4,000,000 sheep and goats and 1,200,000 cattle, or a total of about 2,000,000 animal units, were grazed for some part of the year. With calves and lambs, for which no fee is charged, and the additional stock grazed under free permits to local settlers, nearly 10,000,000 domestic animals grazed national forest ranges (43, p. 28).

Grazing use of the national forests is allowed ranchers and stockmen under a permit system. Ten-year permits are issued for grazing of specified numbers of livestock within certain boundaries, but the permits are subject to adjustment and to cancellation if necessary in the public interest. In the selection of applicants for range, preference is given prior range users and local settlers. It is required that an applicant own or lease land enough to produce feed for the permitted stock during the months when they are not on forest or other public land. Studies have shown that national-forest permittees have continued in business on a stable basis year after year. Use of grazing permits entails close integration of use of the public grazing lands and the privately owned farm and ranch lands on which feed is grown. The economic life of hundreds of communities throughout the West centers around the livestock industry and use of range in the national forests and other public-land areas.



## OTHER LAND-USE MEASURES

Within the last dozen years several other important Federal and State measures relating to range and farm land use and conservation have been adopted. The agricultural conservation program provides financial and material aid for certain beneficial-use practices on privately owned farm land. The Federal Soil Conservation Act provides technical assistance to State soil conservation districts and organized range users, as well as assistance in problems of wind erosion and drainage. Various State laws help assure cooperative measures to improve the use of private land. All of these acts in operation facilitate better use and conservation of both public and private range and farm land. Apparently measures of the types mentioned in the last few pages are indicative of the probable course of future action to permit more adequate maintenance and to bring more profitable use of the land resources.

## PRESENT CONDITION OF THE AGRICULTURAL LAND

Most farmers recognize that crop and livestock production have been pushed hard during the World War II period. It has been a time of emphasis on meeting wartime needs for food and fiber and a time of bumper yields. In general, the harvesting of the expanded crop and forage production has increased the drain on land. This was true despite the increased use of fertilizers, manure, cover crops, and plant residues. Land depletion probably has been partly obscured by the increasing yields resulting from favorable weather, improved varieties, and better practices. Since the end of the war, many farmers have been thinking not only of the postwar level of food needs but also of the steps necessary to attain the stable cropping and grazing pattern of a permanent agriculture. The harvesting of timber also was greatly accelerated during the war. The present situation with regard to soil erosion and conservation, forage depletion, and timber resources is briefly reviewed below.

## SOIL EROSION AND FERTILITY SITUATION

Of the cropland in use in 1947, the Soil Conservation Service estimated that something like one-half is subject to erosion in greater or less degree. Despite more than a decade of widespread application of lime, phosphate, other fertilizers and such practices as contour farming, strip cropping, terracing, and the turning under of cover crops, the farm land as a whole still needs greater use of all these materials and practices. To prevent further deterioration of soil resources, some of the land now in crops should be shifted to pasture or be reforested, and conservation practices should be adopted on much of the remainder (38, *pt. 4, p. 2*).

With the use of good conservation methods about 360 million acres of our present cropland and 100 million acres of land now in plowable pasture or in need of clearing, irrigation, or drainage could be safely used as cropland (6). An additional 50 million acres is classified as suitable for occasional cultivation, provided some improvements are made and conservation practices are used to prevent rapid soil losses.

In some ways, the recurrent use of land for field crops, then pasture and then forest, which has occurred especially in some areas of the East and South and to a lesser extent and with modifications in other parts of the country, amounts to a long-time cycle of depletion by cropping or grazing, or both, followed by restoration by forest and other vegetative growth. The economic and social costs of such extreme changes perhaps might be reduced either by conservation of the land resources already in cultivation, or, if demand for crops lags, by permanent retirement of this land from crops.

TABLE 30.—*Increase in soil loss 1943-44, compared with 1935-39, by regions*<sup>1</sup>

Region	Percentage change	Region	Percentage change
Northeast.....	1	Southern Plains.....	1
Lake States.....	8	Northern Plains.....	2
Corn Belt.....	<sup>2</sup> 12	Mountain.....	0
Appalachian.....	3	Pacific.....	3
Southeast.....	-9		
Mississippi Delta.....	-7	United States.....	3

<sup>1</sup> Wilcox, Walter W. *The Farmer in the Second World War* (51, p. 105).

<sup>2</sup> Does not include the effect of growing intertilled crops continuously on the same field. One estimate including this factor places the wartime increase in the Corn Belt at 18 percent. (See: Ibach, D. B. *Cropland Use and Soil Fertility Practice in War and Peace* (12)).

Up to 1944, the greatest increase in drains on land made by the demands of World War II took place in the Corn Belt and Lake States. The acreage of intertilled crops increased and the acreages of small-grain crops and of idle land declined. Adverse fertility and erosion effects were intensified by the growing of corn and soybeans on the same land for several successive years. Crop rotations were speeded up—that is, successive intertilled crops were planted on hilly land that should not be cultivated in row crops so often. In the Appalachians some idle land that was planted to crops was unsuited to continued cultivation and subject to erosion when so used. Increases in the production of canning crops were a drain in the Pacific region. Little change occurred up to 1944 in soil losses in the Northeast, Great Plains, and Rocky Mountain regions. How to maintain soil resources in much of the Southeast and Mississippi Delta States was a major problem before the war; some progress was recorded during the war period (table 30).

The drain on soil resources has continued since 1944. There are indications that in some areas of the West cropping changes that took place in 1944 and later years have increased the rate of fertility depletion and made the land more susceptible to erosion. There was a substantial expansion in the wheat acreage in the Great Plains and the adjoining Mountain States of Montana, Wyoming, Colorado, and New Mexico. In this 10-State belt, the wheat harvested averaged about 34½ million acres during 1932-41. In 1943, about 39 million acres were harvested and in 1946 nearly 50 million acres.

It is estimated that about 4 million acres of sod was broken for wheat in this belt, mainly in the last 4 years.<sup>17</sup> A conservation survey found that much of this is classed as marginal land unsuited to continuous dry-land cultivation. A further increase in wheat acreage took place in 1947 and possibly is indicated in 1948. A large part of the wheat land is subject to depletion, of one form or another, by continuous cultivation.

#### PASTURE AND RANGE SITUATION

Forage production on pasture and range land is a substantial part of the feed for production of meat, wool, and other livestock products. Western range livestock numbers have all too commonly been too high, and the range lands have suffered through overuse. This is damaging many of the highly valuable watersheds where irrigation agriculture is located.

Overgrazing, depletion of grasses, and resulting erosion of grazing land has not been so great a problem in the humid East as in the West. With the clearing of the forest in the East, the introduced species of grass tended to replace native grasses and the grazing land was incorporated into farms. Here pastures were secondary to the large feed crops as a source of forage for livestock. Prolonged droughts did not occur or were infrequent. Nevertheless, overgrazing and neglect have caused erosion and the displacement of good grasses by weeds, poor grasses, and brush.

In the West, in a natural grassland area having arid to sub-humid climate, extensive areas of public land were available for decades for relatively uncontrolled grazing. Numbers of livestock that could be carried in periods of high rainfall proved impossible in drought periods and repeatedly resulted in overstocking, depletion of vegetation, liquidation of herds, and wind and water erosion. Changes in numbers of all cattle on farms January 1, in the United States, from 1867 to 1948 are illustrated by figure 16.

Data on livestock numbers and feed consumption indicate that the maximum utilization of the range in the 11 Western States was not approached until about 1890. Until then, livestock numbers were increasing rapidly and most of the additional feed was obtained from the range.

After 1890, more and more of the increase in the feed supply came from crops. Overgrazing and depletion probably was occurring in places and some of the range lands were being developed into farms for cultivation. Grazing was being extended to previously unused parts of the range.

A very heavy overstocking of the range took place during World War I, with resultant overgrazing and damage of the range necessitating a reduction in livestock. In the early 1930's there was another peak in number of livestock. This coincided with several drought years and brought a further decline in the grazing capacity.

Surveys of the western range during 1932-35 indicated that the

<sup>17</sup> A report of conditions in the Great Plains States in July 1947 (26) by R. I. Throckmorton, Chairman of the Great Plains Agricultural Committee, showed that nearly 3 million acres of grassland and other stabilized land had been broken for cultivation from 1945 to July 1947.



range area had been depleted 50 percent from its virgin condition, depletion being taken to mean the reduction in grazing capacity for domestic livestock (44, p. 2). More than half of the range showed "severe" or "extreme" depletion and an additional one-third showed "material" depletion. In 1934, there were some 14 million animal units of roughage-consuming livestock, chiefly cattle and sheep, in the 11 Western States and an additional 22 million units in the Great Plains. Overstocking prevailed in many areas.

Declines in cattle and sheep numbers in the 17 Western States from 1934 to 1938 resulted largely from drought conditions, whereas the upturn from 1938 to 1940 came with a period of improved rainfall and moisture. By 1940, an improvement had been attained in the balance between livestock numbers and forage resources in the West.

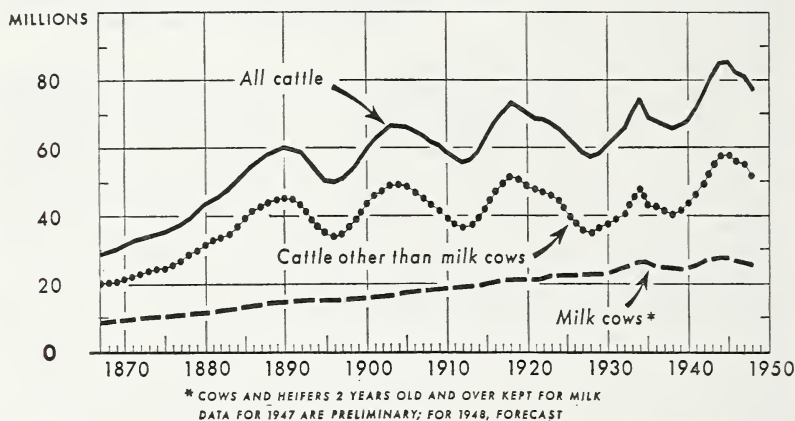


FIGURE 16.—ALL CATTLE ON FARMS, UNITED STATES, 1867-1948.

Total cattle numbers, which reached a new record high at the beginning of 1944, declined moderately in 1945 and continued to decline in 1946. Slaughter had been unusually large since 1943. But with numbers of cattle and calves on farms still high, slaughter, which reached a peak in 1947, is likely to continue large for another year.

In the World War II period stocking of the range was heavy again but this time it happened to come with several years of unusually high rainfall rather than a drought. But in the 17 Western States, cattle numbers increased more than 30 percent during the war. Sheep numbers increased 8 percent from 1940 to 1942 but then declined until they reached a level in 1947 that was 30 percent below 1940. Total animal units of roughage-consuming livestock in the 17 Western States in 1947 were about the same as the average for the period 1932-41 (table 31).

The number of forage-consuming livestock was high during the war but favorable weather, improved pasture conditions, and the adoption of improved management and conservation practices had made the pasture and range areas better able to withstand intensive use. Overgrazing and depletion of the forage base undoubtedly is taking

TABLE 31.—*Roughage-consuming livestock fed, Western States, 1930-46*<sup>1</sup>

Year beginning October 1	17 Western States	Pacific States	Mountain States	Great Plains States
	<i>Number</i>	<i>Number</i>	<i>Number</i>	<i>Number</i>
1930-31-----	35, 046	5, 086	8, 442	19, 001
1931-32-----	35, 645	5, 031	8, 401	19, 605
1932-33-----	36, 996	5, 079	8, 589	20, 655
1933-34-----	38, 897	5, 099	9, 063	21, 936
1934-35-----	35, 075	5, 213	8, 294	19, 050
1935-36-----	34, 382	5, 257	7, 999	18, 631
1936-37-----	33, 387	5, 346	7, 430	18, 070
1937-38-----	32, 150	5, 211	7, 156	17, 306
1938-39-----	31, 741	5, 176	7, 297	16, 873
1939-40-----	32, 783	5, 122	7, 454	17, 816
1940-41-----	34, 084	5, 346	7, 713	18, 626
1941-42-----	36, 221	5, 606	8, 193	19, 972
1942-43-----	38, 121	5, 773	8, 437	21, 479
1943-44-----	38, 971	5, 820	8, 602	22, 115
1944-45-----	38, 385	5, 637	8, 336	22, 117
1945-46-----	36, 484	5, 442	8, 025	20, 834
1946-47-----	34, 859	5, 325	7, 641	19, 849
Average 1932-41-----	34, 572	5, 246	7, 919	18, 894
1946 as percentage of 1932-41 average-----	<i>Percent</i> 100. 8	<i>Percent</i> 101. 5	<i>Percent</i> 96. 5	<i>Percent</i> 105. 1

<sup>1</sup> Jennings, R. D. Animal Units of Livestock Fed Annually, 1919-20 to 1946-47 (14).

place in some areas even though average forage production on the range as a whole has remained fairly high. The wartime increase in cattle numbers was especially high in the Northern Plains and adjoining Mountain States, where wheat acreages also increased greatly. The future level of livestock numbers depends mostly upon rainfall and moisture conditions prevailing in the next few years and upon prompt action being taken by farmers and ranchers to prevent severe damage to the range, especially in the event of drought. It is still early to foresee whether there will be further decline in range forage, or whether, because of favorable weather, the improved programs of range management and conservation will prevent additional damage, stabilize conditions, or permit increase in forage production.

With farm improvement and development of irrigated land, a continually larger proportion of the total feed supply in the western region has been coming from farm land. But the feed obtained from range land in the West still amounts to half the total feed for all livestock (22, pp. 8-10).

#### FOREST-RESOURCE SITUATION<sup>18</sup>

Our acreage of forest land has declined greatly in the last century but there remain some 624 million acres, or about one-third of the

<sup>18</sup> Gaging the Timber Resources of the United States (41).

total land of the country, that is useful as forest land. The recent reappraisal of the forest situation by the Forest Service showed that the acreage available for timber growing would be ample ultimately for national needs if reasonably good timber management is practiced. But, in future, more and more dependence must be placed upon the timber grown each year, instead of depending upon the harvest of virgin timber.

Current annual growth of all timber is estimated at 13.4 billion cubic feet, including 35.3 billion board feet of saw timber. The cut of timber in 1944 was 12.2 billion cubic feet, including 49.7 billion board feet of saw timber. Besides the timber cut, there is a loss from fire, insects, disease, wind, and other natural causes, amounting to 1.5 billion cubic feet, including 4.2 billion board feet of saw timber. It might also be mentioned that the timber cut has increased somewhat since 1944, when the survey was made. The 1944 growth of all timber was only about two-thirds, and of saw timber one-half, of the quantity the forest should ultimately be growing.

The need is to build up productive growing stock, whereas the past trend has been in the opposite direction. The problem is complicated by the fact that eastern forests, in the area of high consumption of lumber, are now largely "second growth" so that continued heavy cutting will deplete the productive growing stock. In the West, on the other hand, there are still relatively large reaches of virgin timber. The problem is to balance timber drain in the East with the need for building up growing stock there and at the same time to meet much of the current needs for lumber from western virgin stands without damaging the future of western timber production.

### EXPECTED TRENDS IN LAND UTILIZATION

Our present high level of agricultural production is based upon more intensive use of the land than in the past, a high production per acre, and a high production per agricultural worker. In 1946, crop production per acre was more than 20 percent above prewar (1935-39) and production per worker was up more than 35 percent.

Over a series of years, farmers and ranchers tend to make first those changes in land use and in methods and practices that appear to them to be most profitable, consistent with their technical and financial abilities and their beliefs concerning individual and national needs, such as their need for current income, the need for food and other products, and the need for permanent maintenance of soil resources.

In times of prosperity, changes that increase output—as more intensive land use and adoption of better practices and methods—are likely to occur more rapidly under the incentive of high prices and the availability of funds for new machinery, equipment, better livestock, better seed. Only in areas that are poorly adapted to crops has prosperity brought declines in intensity of land use through abandonment of farms by men who find more profitable employment in industry or in other nonagricultural occupations.

Depressions slow down the rate of change. Lower prices, lower cash resources, and other causes lower the incentive to change. Within the limits of available means, however, farmers and ranchers seek to



maintain or increase their output and their efficiency as a way of combating low prices. Previous investments in land, machinery, livestock, and farm equipment cannot be readily withdrawn from production and placed on a stand-by basis. New production methods are likely to continue to spread. During the 1930's, the gross farm production, the production per farm worker, per acre, and per animal unit, the numbers of tractors, lime and fertilizer consumption all were maintained at about their former level, or were increased.

The outlook is for continued high agricultural production. Farmers who can adopt new methods will have an advantage over farmers who cannot take advantage of improvements that reduce the unit cost of products. The comparative advantage of farms of suitable size and high fertility will probably increase, compared with farms of inadequate size and low fertility. Some indication of the probable direction of changes in land utilization in the near future can be had from recent trends in land use and farming methods.

#### GENERAL STABILITY OF TOTAL ACREAGE USED FOR CROPS

The total acreage of land used for crops has been relatively stable for several decades. New lands developed by plowing of sod, clearing of forests, drainage, and irrigation have been offset by conversion of cropland to pasture and reversion to forest. Such reductions have taken place mainly in areas that are ill-suited to continued crop production because of loss of fertility, erosion, deficient rainfall, or other circumstances. During the 1920's and 1930's, droughts, mortgage foreclosures, and tax delinquencies led to the abandonment of cropland to grazing or forest uses. In broad areas and within individual farms, cropland tended to be more and more concentrated on the soils best suited to crops. In general, the land resources were used less intensively, and fertility and moisture reserves were maintained or built up. Mechanization was increased particularly on the more level and fertile soils. This increased the acreage that the labor force could operate and led many farmers to buy or rent additional land. Mechanization also released for the production of marketable products large acreages that formerly were used to feed workstock. The average size of farms expanded greatly and the number of farms declined. Some of the farms that were abandoned during the 1920's were reoccupied during the depression only to be abandoned again for farming when industrial employment called during World War II. Some of the semiarid and hilly cropland that had been seeded or allowed to revert to grass or lie fallow or idle before World War II was plowed again for crops in the last few years.

The total acreage of cropland or land that could be devoted to crops any one year, exclusive of rotation and plowable pasture, has not changed greatly since 1920.<sup>19</sup> In that year there were 402 million

<sup>19</sup> The estimated acreage of land used for crops in fig. 17 only includes cropland harvested, crop failure, and summer-fallow acreage. It excludes temporarily idle cropland and land in rotation pasture. In crop-production comparisons as those in fig. 17 it is usual to omit the idle cropland from the acreages considered used for crops. Estimates of total cropland which might be planted in any one year, however, without drawing on rotation pasture, usually includes idle cropland as well as planted and fallowed acreages.

acres, and in 1947 there were 407 million acres. (Refer to table 16 and fig. 9 for data, 1920-45.) There were considerable fluctuations in use of land between years, as crop acreages were reduced or increased and more land was used for pasture or allowed to lie idle and in some places to revert to forest growth.

From 1930 to 1940 there was a net decrease in the total acreage of cropland of about 14 million acres; but there was an 8-million-acre increase from 1940 to 1947. Some decline in cropland acreage may be anticipated after this war-and-relief period is over. Mechanization and other technological advances will probably have additional far-reaching effects on land use in the next few years. Adoption of

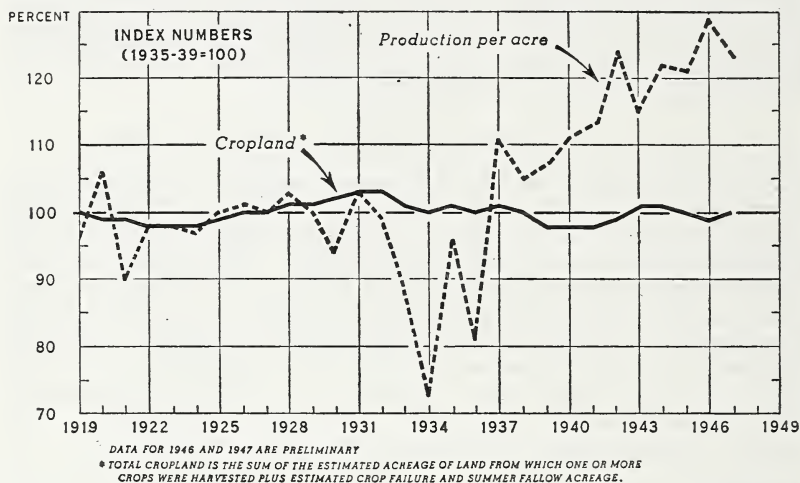


FIGURE 17.—TOTAL CROPLAND, AND CROP PRODUCTION PER ACRE, UNITED STATES, 1919-1946

Total land used for crops changed little from 1919 to 1946. The term "total cropland" as used in this chart includes land used for crops; that is, the sum of the acreage of land from which one or more crops were harvested plus fallow and crop failure acreage, exclusive of cropland temporarily idle.

tractors and new mechanical developments should not be overlooked as influential in accounting for the stabilization of the total cropland acreage around 400 million acres between 1920 and 1945. There is a question, however, whether additional mechanization will continue to release from production of workstock feed as large acreages for other uses as it has in the last two decades. As the limit of substitution of mechanical power for horsepower is approached, more new cropland is likely to be required.

There is a strong demand that soil conservation work be continued and improved in nearly all regions. On account of world need for food and plans for distribution there is a feeling that agriculture is not out of heavy production and that long-range measures must be adopted to maintain the land resources in productive condition.

Many farmers in the Corn Belt and northern Plains think that the recent drain of soil nutrients must be eased and a better balance attained between row crops, close-growing crops, legumes, and grasses. These regions in particular have not fully maintained their standing in soil and water conservation during this war and relief period. Increased hay and pasture land in the Corn Belt will mean less cropland and will require more roughage-consuming livestock. Similarly, some of the semiarid lands and the hill lands plowed for crops during the war will have to be returned to grass.

Further shifting of steep, depleted croplands to pasture or forest can be expected in the hill sections of the East and South. Further shifting from corn to hay and small grains can perhaps be expected with increased mechanization in the South. In many areas increased livestock numbers will exert pressure for continued large feed-crop production and will tend to maintain present crop acreages. At the same time, development of new cropland will continue through irrigation in the West and through drainage, particularly in the Mississippi Delta. On many farms wet lands can be drained and used for crops and adjoining erosive hill lands can be returned to grass or forests.

#### PASTURE AND RANGE LAND

The acreage of pasture and range land has declined since about 1890 as sod lands were plowed for crops and as land was used for urban purposes, roads, and other purposes. Once the wartime and relief plow-up of sod ground for wheat is finished, it is probable that the total pasture and range area will gradually increase. Poor croplands will be seeded to grass or will revert naturally, especially in the Southeast and South and in the part of the Great Plains where the temporary plow-up for wheat has been marked. Clearing of forests, especially in the South and in the far West, may for a time add to the unimproved pasture acreage, partly as an incidental byproduct. Some pasture will revert to forest, especially in the South and West, but it is doubtful whether this will be enough in the next few years to offset the increases in pasture acreage coming from other sources.

#### FOREST LAND

Steady improvement has been made in the accuracy and adequacy of the surveys of forest land in this country. Deficiencies in the area covered and intensity of study in early years cast doubt upon the comparability of some of the estimates, but there is no question as to the rapid decline in forest acreage from 1880 to 1910, and from 1930 to 1945. A continuation of the decline in total forest land in some areas seems probable for a while in view of the certainty of clearing and development for farming of fertile woodland. A continued heavy demand for timber would not in itself lead to a decrease in forest area, but might encourage an increase in forest land in some regions. It would be likely, however, to reduce the area of mature timber. Reversion of crop and pasture land in the East and South will probably not equal clearing in all areas, especially in the Delta and in the West, if recent trends continue.



## SPECIAL-USE AREAS

The area devoted to special uses—urban lands, highways, roads, parks, military reservations, game refuges, airports—has increased rapidly as the country has developed and population has increased. In view of wartime increases, it seems probable that figures covering the special-use areas will remain high in the next decade. Some increases can be expected in the extent of urban areas, parks, game refuges, and highways, but some of the land held for military purposes during the war is being returned to agriculture.

## LAND HAVING SLIGHT AGRICULTURAL VALUE

Processes of drainage and irrigation, the reservation of recreational areas, and the stocking of wildlife, have steadily reduced the area having slight agricultural value. Many points of scenic beauty and historic interest have been reserved as parks and monuments, swamplands and desert lands have been set aside as game refuges, irrigation water has been brought to deserts by deep wells and by storage reservoirs, and swamplands have been drained and brought into cultivation. It is probable that this process on lands of slight surface-use value will continue in the next decade. Most of the lands still to be developed by irrigation and drainage are now used for some form of crop, pasture, or timber production. Numerous State, county, and municipal parks will probably be established, but apparently no major expansion of the National Park System is indicated and the new areas set aside are more likely to include forests than desert, barren, swamp, or rock-outcrop land.

## FUTURE LAND USE MEASURES

Adjustments needed from time to time in land use in order to meet production requirements are so many and varied that to attempt detailed discussion here of changes would be impracticable. A number of different land-use measures are needed to meet the conditions in different parts of the country. In the last decade or two much has been done in charting better land use and in conservation of land resources. Much remains to be done.

A single illustration of needed work that applies rather widely may be mentioned here. It is known and recognized, for example, that arrangements for range-land and farm-land use are more likely to be successful if they are based on the productivity of the land and on its capacity for use without serious injury over long periods. Experience makes it clear that charting an effective course for land use must be founded on adequate facts as to the location, extent, and productive character of the land suitable for agriculture. Completion of soil and land-productivity surveys for the entire country is essential. Certainly, too, there should be arrangements that would encourage rural land use based on careful land classification. Only by this procedure can the unwise use of land be avoided and the best development be assured.

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## APPENDIX

In these tables some items for land outside farms are subject to revision as more exact data are obtained.

TABLE 32.—*Major uses of land, United States, 1945*

State	Total land area <sup>1</sup>	Crop- land <sup>2</sup>	Pasture and range land (nonfor- ested)	Forest land <sup>3</sup>	Special use areas <sup>4</sup>	Miscel- laneous other land, most of which has low agricul- tural value <sup>5</sup>
	1,000 acres	1,000 acres	1,000 acres	1,000 acres	1,000 acres	1,000 acres
Alabama.....	32,690	7,412	3,294	18,748	1,286	1,950
Arizona.....	72,691	729	43,595	19,466	7,132	1,769
Arkansas.....	33,744	7,121	3,979	19,928	1,186	1,530
California.....	100,354	9,167	24,751	43,891	10,148	12,397
Colorado.....	66,539	8,042	33,611	19,533	2,261	3,092
Connecticut.....	3,135	458	342	1,833	417	85
Delaware.....	1,266	501	103	442	98	122
District of Columbia.....	39	1	0	0	38	0
Florida.....	34,728	2,314	4,569	22,759	2,078	3,008
Georgia.....	37,452	9,859	2,395	21,028	2,154	2,016
Idaho.....	52,997	4,267	23,708	18,797	692	5,533
Illinois.....	35,806	21,433	6,053	3,326	2,509	2,485
Indiana.....	23,171	11,723	4,292	3,397	1,571	2,188
Iowa.....	35,831	22,330	8,371	2,224	2,055	851
Kansas.....	52,552	27,549	21,202	1,101	2,038	662
Kentucky.....	25,670	6,361	7,722	9,684	1,441	462
Louisiana.....	28,913	4,103	2,535	15,836	1,334	5,105
Maine.....	19,866	1,416	513	16,751	546	640
Maryland.....	6,328	1,970	866	2,656	472	364
Massachusetts.....	5,060	626	324	3,242	733	135
Michigan.....	36,494	9,424	4,073	18,821	2,443	1,733
Minnesota.....	51,206	20,976	5,141	19,656	2,615	2,818
Mississippi.....	30,349	7,436	4,233	15,640	1,214	1,826
Missouri.....	44,333	13,941	12,553	15,187	1,934	718
Montana.....	93,642	10,919	53,786	23,536	2,806	2,595
Nebraska.....	49,058	22,486	23,315	892	1,774	591
Nevada.....	70,273	510	53,751	4,708	6,354	4,950
New Hampshire.....	5,775	461	279	4,775	219	41
New Jersey.....	4,814	1,020	292	2,294	1,036	172
New Mexico.....	77,767	2,367	50,552	19,968	3,075	1,805
New York.....	30,675	7,662	5,254	10,881	4,419	2,459
North Carolina.....	31,451	7,076	1,625	18,164	1,773	2,813
North Dakota.....	44,835	24,393	15,135	557	1,732	2,998
Ohio.....	26,318	11,435	6,419	4,820	1,960	1,684
Oklahoma.....	44,341	15,204	16,106	10,581	1,683	767
Oregon.....	61,664	4,343	25,742	29,387	1,357	835
Pennsylvania.....	28,829	7,373	3,266	15,165	2,066	959
Rhode Island.....	677	71	51	393	141	21
South Carolina.....	19,580	4,949	867	10,459	973	2,332
South Dakota.....	48,983	17,862	25,823	1,545	1,996	1,757
Tennessee.....	26,855	7,013	4,707	11,899	1,733	1,503
Texas.....	168,732	30,241	95,358	35,737	4,241	3,155

See footnotes at end of table.

TABLE 32.—*Major uses of land, United States, 1945*—Continued

State	Total land area <sup>1</sup>	Crop- land <sup>2</sup>	Pasture and range land (nonfor- ested)	Forest land <sup>3</sup>	Special use areas <sup>4</sup>	Miscel- laneous other land, most of which has low agricul- tural value <sup>5</sup>
	1,000 acres	1,000 acres	1,000 acres	1,000 acres	1,000 acres	1,000 acres
Utah-----	52, 701	1, 536	35, 561	8, 462	2, 886	4, 256
Vermont-----	5, 938	1, 188	1, 116	3, 356	164	114
Virginia-----	25, 535	4, 623	4, 327	14, 488	1, 386	711
Washington-----	42, 865	6, 693	9, 532	23, 268	2, 469	903
West Virginia-----	15, 418	1, 662	3, 555	9, 434	530	237
Wisconsin-----	35, 018	10, 891	5, 745	15, 983	1, 972	427
Wyoming-----	62, 404	2, 108	46, 558	7, 019	2, 871	3, 848
United States-----	1, 905, 362	403, 245	706, 947	601, 717	100, 031	93, 422

<sup>1</sup> Data from U. S. Census of Agriculture, 1945 (34).<sup>2</sup> Cropland harvested, crop failure, and cropland idle or fallow from U. S. Census, 1945.<sup>3</sup> Exclusive of about 14 million acres of forest land in parks, preserves, etc., and about 8 million acres of woodland reported as open farm pasture land. Includes grazed forest land.<sup>4</sup> Estimated area included in: Farm roads and lanes, farmsteads, rural public highways and roads, rural railroad rights-of-way, parks, game refuges, airports, military lands, etc.<sup>5</sup> Estimated area of marshes, sand dunes, rock, desert, and similar areas having low surface value except for wildlife and watershed protection and recreation.



TABLE 33.—*Major uses of land, by regions, 1945*

Regions (Groups of States)	Total land area <sup>1</sup>	Crop- land <sup>2</sup>	Pas- ture and range land non- for- ested	Forest land <sup>3</sup>	Special use areas <sup>4</sup>	Miscel- laneous other land, most of which has low agricul- tural value <sup>5</sup>
	1,000 acres	1,000 acres	1,000 acres	1,000 acres	1,000 acres	1,000 acres
Northeast.....	104, 769	20, 275	11, 437	58, 690	9, 741	4, 626
Lake States.....	122, 718	41, 291	14, 959	54, 460	7, 030	4, 978
Corn Belt.....	165, 459	80, 862	37, 688	28, 954	10, 029	7, 926
Appalachian.....	132, 562	29, 207	22, 905	66, 767	<sup>6</sup> 7, 471	6, 212
Southeast.....	124, 450	24, 534	11, 125	72, 994	6, 491	9, 306
Mississippi Delta.....	93, 006	18, 660	10, 747	51, 404	3, 734	8, 461
Northern Plains.....	195, 428	92, 290	85, 475	4, 095	7, 560	6, 008
Southern Plains.....	213, 073	45, 445	111, 464	46, 318	5, 924	3, 922
Mountain.....	549, 014	30, 478	341, 122	121, 489	28, 077	27, 848
Pacific.....	204, 883	20, 203	60, 025	96, 546	13, 974	14, 135
United States.....	1, 905, 362	403, 245	706, 947	601, 717 <sup>6</sup>	100, 031	93, 422

<sup>1</sup> Data from United States Census of Agriculture 1945 (34).<sup>2</sup> Cropland harvested, crop failure, and cropland idle or fallow from Census of Agriculture 1945 (34).<sup>3</sup> Exclusive of about 14 million acres of forest land in parks, preserves, etc., and about 8 million acres of woodland reported as open farm pasture land. Includes grazed forest land.<sup>4</sup> Estimated area included in: Farm roads and lanes, farmsteads, rural public highways and roads, rural railroad rights-of-way, parks, game refuges, airports, military lands, etc.<sup>5</sup> Estimated area of marshes, sand dunes, rock, desert, and similar areas having low surface-use value except for wildlife and watershed protection and recreation.<sup>6</sup> Approximately 1,000 acres of land classified by Census of Agriculture as cropland in District of Columbia is included under cropland in this table.

NOTE.—Regions or groups of States for which data are given are shown by the map in figure 3.

TABLE 34.—*Land in farms, by States, 1945*

State	Total land in farms <sup>1</sup>	Crop- land <sup>2</sup>	Open or non- forested pasture <sup>3</sup>	Wood- land pas- ture	Wood- land not pas- tured	Other land in farms <sup>4</sup>
	1,000 acres	1,000 acres	1,000 acres	1,000 acres	1,000 acres	1,000 acres
Alabama.....	19, 068	7, 412	3, 294	2, 917	4, 659	786
Arizona.....	37, 856	729	30, 745	6, 007	14	361
Arkansas.....	17, 456	7, 121	3, 979	2, 383	3, 167	806
California.....	35, 054	9, 167	20, 407	3, 341	691	1, 448
Colorado.....	36, 218	8, 042	25, 931	1, 311	95	839
Connecticut.....	1, 593	458	342	232	447	114
Delaware.....	923	501	103	9	223	87

See footnotes at end of table.

TABLE 34.—*Land in farms, by States, 1945*—Continued

State	Total land in farms <sup>1</sup>	Crop- land <sup>2</sup>	Open or non- forested pasture <sup>3</sup>	Wood- land pas- ture	Wood- land not pas- tured	Other land in farms <sup>4</sup>
	1,000 acres	1,000 acres	1,000 acres	1,000 acres	1,000 acres	1,000 acres
District of Columbia.....	2	1	0	0	0	1
Florida.....	13, 083	2, 314	4, 569	4, 527	1, 274	399
Georgia.....	23, 676	9, 859	2, 395	3, 508	7, 214	700
Idaho.....	12, 503	4, 267	6, 552	946	114	624
Illinois.....	31, 602	21, 433	6, 053	1, 688	786	1, 624
Indiana.....	20, 027	11, 723	4, 292	1, 710	964	1, 338
Iowa.....	34, 454	22, 330	8, 371	1, 452	225	2, 076
Kansas.....	48, 589	27, 549	18, 571	450	237	1, 782
Kentucky.....	19, 725	6, 361	7, 722	1, 172	3, 353	1, 117
Louisiana.....	10, 040	4, 103	2, 535	1, 386	1, 494	522
Maine.....	4, 613	1, 416	513	612	1, 839	233
Maryland.....	4, 200	1, 970	866	127	974	263
Massachusetts.....	2, 078	626	324	300	640	188
Michigan.....	18, 392	9, 424	4, 073	2, 275	1, 226	1, 394
Minnesota.....	33, 140	20, 976	5, 141	3, 057	1, 209	2, 757
Mississippi.....	19, 617	7, 436	4, 233	3, 571	3, 376	1, 001
Missouri.....	35, 278	13, 941	12, 553	5, 159	1, 973	1, 652
Montana.....	58, 787	10, 919	45, 956	986	99	827
Nebraska.....	47, 753	22, 486	23, 128	377	134	1, 628
Nevada.....	6, 178	510	5, 456	76	7	129
New Hampshire.....	2, 017	461	279	446	755	76
New Jersey.....	1, 818	1, 020	292	39	259	208
New Mexico.....	49, 608	2, 367	41, 750	4, 646	84	761
New York.....	17, 568	7, 662	5, 254	1, 523	2, 100	1, 029
North Carolina.....	18, 618	7, 076	1, 625	1, 093	8, 106	718
North Dakota.....	41, 001	24, 393	12, 749	316	158	3, 385
Ohio.....	21, 928	11, 435	6, 419	1, 560	1, 107	1, 407
Oklahoma.....	36, 162	15, 204	15, 111	4, 119	399	1, 329
Oregon.....	19, 754	4, 343	11, 652	2, 772	490	497
Pennsylvania.....	15, 020	7, 373	3, 266	974	2, 338	1, 069
Rhode Island.....	265	71	51	18	92	33
South Carolina.....	11, 022	4, 949	867	986	3, 828	392
South Dakota.....	43, 032	17, 862	23, 133	194	79	1, 764
Tennessee.....	17, 789	7, 013	4, 707	1, 333	3, 720	1, 016
Texas.....	141, 338	30, 241	92, 473	16, 051	818	1, 755
Utah.....	10, 309	1, 536	8, 391	173	11	198
Vermont.....	3, 931	1, 188	1, 116	857	694	76
Virginia.....	16, 358	4, 623	4, 327	1, 177	5, 643	588
Washington.....	16, 720	6, 693	7, 242	1, 862	473	450
West Virginia.....	8, 720	1, 662	3, 555	1, 100	2, 127	276
Wisconsin.....	23, 615	10, 891	5, 745	3, 976	1, 535	1, 468
Wyoming.....	33, 117	2, 108	30, 358	281	11	359
United States.....	1, 141, 615	403, 245	528, 466	95, 075	71, 261	43, 568

<sup>1</sup> Data for land in farms are from United States agricultural census reports for 1945 (34).

<sup>2</sup> "Cropland" includes cropland harvested, crop failure, and fallow or idle cropland.

<sup>3</sup> Open or nonforested pasture in farms includes rotation pasture or cropland used for pasture that was plowed in last 7 years, other plowable pasture, and other nonforested land used for pasture in farms.

<sup>4</sup> Other land in farms includes farmsteads, roads, and other special-use areas often included in farm areas as well as some land of low agricultural value, such as badly eroded or open swamp, rock, and sand.

TABLE 35.—*Land not in farms, by States, 1945*

State	Total <sup>1</sup>	Nonforested pasture and range <sup>2</sup>	Forest land <sup>3</sup>	Other <sup>4</sup>
	<i>1,000 acres</i>	<i>1,000 acres</i>	<i>1,000 acres</i>	<i>1,000 acres</i>
Alabama	13, 622	0	11, 172	2, 450
Arizona	34, 835	12, 850	13, 445	8, 540
Arkansas	16, 288	0	14, 378	1, 910
California	65, 300	4, 344	39, 859	21, 097
Colorado	30, 321	7, 680	18, 127	4, 514
Connecticut	1, 542	0	1, 154	388
Delaware	343	0	210	133
District of Columbia	37	0	0	37
Florida	21, 645	0	16, 958	4, 687
Georgia	13, 776	0	10, 306	3, 470
Idaho	40, 494	17, 156	17, 737	5, 601
Illinois	4, 204	0	852	3, 352
Indiana	3, 144	0	723	2, 421
Iowa	1, 377	0	547	830
Kansas	3, 963	2, 631	414	918
Kentucky	5, 945	0	5, 159	786
Louisiana	18, 873	0	12, 956	5, 917
Maine	15, 253	0	14, 300	953
Maryland	2, 128	0	1, 555	573
Massachusetts	2, 982	0	2, 302	680
Michigan	18, 102	0	15, 320	2, 782
Minnesota	18, 066	0	15, 390	2, 676
Mississippi	10, 732	0	8, 693	2, 039
Missouri	9, 055	0	8, 055	1, 000
Montana	34, 855	7, 830	22, 451	4, 574
Nebraska	1, 305	187	381	737
Nevada	64, 095	48, 295	4, 625	11, 175
New Hampshire	3, 758	0	3, 574	184
New Jersey	2, 996	0	1, 996	1, 000
New Mexico	28, 159	8, 802	15, 238	4, 119
New York	13, 107	0	7, 258	5, 849
North Carolina	12, 833	0	8, 965	3, 868
North Dakota	3, 834	2, 386	83	1, 365
Ohio	4, 390	0	2, 153	2, 237
Oklahoma	8, 179	995	6, 063	1, 121
Oregon	41, 910	14, 090	26, 125	1, 695
Pennsylvania	13, 809	0	11, 853	1, 956
Rhode Island	412	0	283	129
South Carolina	8, 558	0	5, 645	2, 913
South Dakota	5, 951	2, 690	1, 272	1, 989
Tennessee	9, 066	0	6, 846	2, 220
Texas	27, 394	2, 885	18, 868	5, 641
Utah	42, 392	27, 170	8, 278	6, 944
Vermont	2, 007	0	1, 805	202
Virginia	9, 177	0	7, 668	1, 509
Washington	26, 145	2, 290	20, 933	2, 922
West Virginia	6, 698	0	6, 207	491
Wisconsin	11, 403	0	10, 472	931
Wyoming	29, 287	16, 200	6, 727	6, 360
United States	763, 747	178, 481	435, 381	149, 885

<sup>1</sup> Data from U. S. Census of Agriculture, 1945 (34).<sup>2</sup> For source see footnote 4, table 38.<sup>3</sup> Estimated available nonfarm forest land outside of parks, preserves, military reservations, etc. Includes about 250 million acres grazed.<sup>4</sup> Includes estimated acreages in parks, game refuges, military lands, airports, rural public highways and roads outside farm boundaries, and rural railroad rights-of-way outside farm boundaries. Includes estimated total area of marshes, sand dunes, rock, desert, and similar areas having limited surface-use value except for wildlife and watershed protection and recreation.



TABLE 36.—*Cropland, by States, 1945*<sup>1</sup>

State	Crop- land har- vested	Crop failure	Land used for crops	Crop- and idle or fallow	Total crop- land <sup>2</sup>
	<i>1,000 acres</i>	<i>1,000 acres</i>	<i>1,000 acres</i>	<i>1,000 acres</i>	<i>1,000 acres</i>
Alabama.....	6, 163	58	6, 221	1, 191	7, 412
Arizona.....	652	21	673	56	729
Arkansas.....	5, 995	135	6, 130	991	7, 121
California.....	7, 536	108	7, 644	1, 523	9, 167
Colorado.....	6, 035	514	6, 549	1, 493	8, 042
Connecticut.....	433	3	436	22	458
Delaware.....	416	17	433	68	501
District of Columbia.....	1	0	1	0	1
Florida.....	1, 809	31	1, 840	474	2, 314
Georgia.....	7, 824	91	7, 915	1, 944	9, 859
Idaho.....	3, 442	25	3, 467	800	4, 267
Illinois.....	20, 302	266	20, 568	865	21, 433
Indiana.....	10, 912	131	11, 043	680	11, 723
Iowa.....	21, 562	593	22, 155	175	22, 330
Kansas.....	22, 817	1, 346	24, 163	3, 386	27, 549
Kentucky.....	5, 322	56	5, 378	983	6, 361
Louisiana.....	3, 490	94	3, 584	519	4, 103
Maine.....	1, 315	16	1, 331	85	1, 416
Maryland.....	1, 745	13	1, 758	212	1, 970
Massachusetts.....	581	8	589	37	626
Michigan.....	8, 521	112	8, 633	791	9, 424
Minnesota.....	18, 559	1, 339	19, 898	1, 078	20, 976
Mississippi.....	6, 473	113	6, 586	850	7, 436
Missouri.....	12, 902	397	13, 299	642	13, 941
Montana.....	7, 440	317	7, 757	3, 162	10, 919
Nebraska.....	19, 596	1, 250	20, 846	1, 640	22, 486
Nevada.....	487	3	490	20	510
New Hampshire.....	436	7	443	18	461
New Jersey.....	916	15	931	89	1, 020
New Mexico.....	1, 957	170	2, 127	240	2, 367
New York.....	6, 922	162	7, 084	578	7, 662
North Carolina.....	6, 123	44	6, 170	906	7, 076
North Dakota.....	20, 817	546	21, 363	3, 030	24, 393
Ohio.....	10, 837	82	10, 919	516	11, 435
Oklahoma.....	14, 088	266	14, 354	850	15, 204
Oregon.....	3, 276	27	3, 303	1, 040	4, 343
Pennsylvania.....	6, 604	60	6, 664	709	7, 373
Rhode Island.....	62	1	63	8	71
South Carolina.....	4, 149	24	4, 173	776	4, 949
South Dakota.....	16, 525	713	17, 238	624	17, 862
Tennessee.....	5, 843	81	5, 924	1, 089	7, 013
Texas.....	27, 469	794	28, 263	1, 978	30, 241
Utah.....	1, 248	14	1, 262	274	1, 536
Vermont.....	1, 160	11	1, 171	17	1, 188
Virginia.....	3, 933	47	3, 980	643	4, 623
Washington.....	4, 290	26	4, 316	2, 377	6, 693
West Virginia.....	1, 490	15	1, 505	157	1, 662
Wisconsin.....	10, 545	69	10, 614	277	10, 891
Wyoming.....	1, 843	66	1, 909	199	2, 108
United States.....	352, 866	10, 297	363, 163	40, 082	403, 245

<sup>1</sup> Data from U. S. Census of Agriculture, 1945 (34).<sup>2</sup> Exclusive of "cropland used only for pasture."

TABLE 37.—*Cropland, by regions, 1945*<sup>1</sup>

Region	Cropland harvested	Crop failure	Land used for crops	Cropland idle or fallow	Total cropland <sup>2</sup>
	<i>1,000 acres</i>	<i>1,000 acres</i>	<i>1,000 acres</i>	<i>1,000 acres</i>	<i>1,000 acres</i>
Northeast.....	18,429	283	18,712	1,563	20,275
Lake States.....	37,625	1,520	39,145	2,146	41,291
Corn Belt.....	76,515	1,469	77,984	2,878	80,862
Appalachian.....	24,876	273	25,149	4,058	29,207
Southeast.....	19,945	204	20,149	4,385	24,534
Mississippi Delta.....	15,958	342	16,300	2,360	18,660
Northern Plains.....	79,755	3,855	83,610	8,680	92,290
Southern Plains.....	41,557	1,060	42,617	2,828	45,445
Mountain.....	23,104	1,130	24,234	6,244	30,478
Pacific.....	15,102	161	15,263	4,940	20,203
United States.....	352,866	10,297	363,163	40,082	403,245

<sup>1</sup> Data from U. S. Census of Agriculture, 1945 (34).<sup>2</sup> Exclusive of "cropland used only for pasture."TABLE 38.—*Pasture and grazing land (largely nonforested), by States, 1945*

State	Plow- able pas- ture <sup>1</sup>	Non- plow- able non- forested pasture <sup>2</sup>	All non- forested pasture in farms <sup>3</sup>	Nonfor- ested pasture and range outside farms <sup>4</sup>	Total pasture and range land (nonfor- ested)
	<i>1,000 acres</i>	<i>1,000 acres</i>	<i>1,000 acres</i>	<i>1,000 acres</i>	<i>1,000 acres</i>
Alabama.....	2,234	1,060	3,294	0	3,294
Arizona.....	230	30,515	30,745	12,850	43,595
Arkansas.....	1,791	2,188	3,979	0	3,979
California.....	2,257	18,150	20,407	4,344	24,751
Colorado.....	3,893	22,038	25,931	7,680	33,611
Connecticut.....	173	169	342	0	342
Delaware.....	94	9	103	0	103
District of Columbia.....	0	0	0	0	0
Florida.....	1,499	3,070	4,569	0	4,569
Georgia.....	1,500	895	2,395	0	2,395
Idaho.....	581	5,971	6,552	17,156	23,708
Illinois.....	3,319	2,734	6,053	0	6,053
Indiana.....	3,088	1,204	4,292	0	4,292
Iowa.....	4,983	3,388	8,371	0	8,371
Kansas.....	5,382	13,189	18,571	2,631	21,202
Kentucky.....	6,697	1,025	7,722	0	7,722
Louisiana.....	1,327	1,208	2,535	0	2,535
Maine.....	265	248	513	0	513
Maryland.....	596	270	866	0	866
Massachusetts.....	207	117	324	0	324
Michigan.....	2,800	1,273	4,073	0	4,073
Minnesota.....	3,234	1,907	5,141	0	5,141
Mississippi.....	2,435	1,798	4,233	0	4,233
Missouri.....	5,212	7,341	12,553	0	12,553

See footnotes at end of table.

TABLE 38.—*Pasture and grazing land (largely nonforested), by States, 1945—Continued*

State	Plow- able pas- ture <sup>1</sup>	Non- plow- able non- forested pasture <sup>2</sup>	All non- forested pasture in farms <sup>3</sup>	Nonfor- ested pasture and range outside farms <sup>4</sup>	Total pasture and range land (nonfor- ested)
	1,000 acres	1,000 acres	1,000 acres	1,000 acres	1,000 acres
Montana.....	3, 833	42, 123	45, 956	7, 830	53, 786
Nebraska.....	3, 000	20, 128	23, 128	187	23, 315
Nevada.....	47	5, 409	5, 456	48, 295	53, 751
New Hampshire.....	142	137	279	0	279
New Jersey.....	172	120	292	0	292
New Mexico.....	2, 355	39, 395	41, 750	8, 802	50, 552
New York.....	2, 519	2, 735	5, 254	0	5, 254
North Carolina.....	999	626	1, 625	0	1, 625
North Dakota.....	2, 859	9, 890	12, 749	2, 386	15, 135
Ohio.....	3, 654	2, 765	6, 419	0	6, 419
Oklahoma.....	3, 497	11, 614	15, 111	995	16, 106
Oregon.....	1, 052	10, 600	11, 652	14, 090	25, 742
Pennsylvania.....	1, 477	1, 789	3, 266	0	3, 266
Rhode Island.....	24	27	51	0	51
South Carolina.....	662	205	867	0	867
South Dakota.....	5, 343	17, 790	23, 133	2, 690	25, 823
Tennessee.....	3, 569	1, 138	4, 707	0	4, 707
Texas.....	9, 267	83, 206	92, 473	2, 885	95, 358
Utah.....	274	8, 117	8, 391	27, 170	35, 561
Vermont.....	309	807	1, 116	0	1, 116
Virginia.....	2, 793	1, 534	4, 327	0	4, 327
Washington.....	771	6, 471	7, 242	2, 290	9, 532
West Virginia.....	1, 795	1, 760	3, 555	0	3, 555
Wisconsin.....	2, 663	3, 082	5, 745	0	5, 745
Wyoming.....	1, 590	28, 768	30, 358	16, 200	46, 558
United States.....	108, 463	420, 003	528, 466	178, 481	706, 947

<sup>1</sup> Based on Production Adjustments in Agriculture, 1946 (39). Includes 35,930,000 acres of rotation pasture and 72,533,000 acres of other plowable pasture. The latter total was distributed by States in proportion to average other plowable pasture acreage for each State during 1935-39. Minor adjustments were made for Arizona, Florida, Georgia, Michigan, Minnesota, Texas, and Wisconsin.

<sup>2</sup> "Cropland used only for pasture" plus "other land pastured" from the census of Agriculture, 1945 (34)—"plowable pasture," as established above.

<sup>3</sup> Data from census of Agriculture 1945 (34). All nonforested pasture in farms includes cropland formerly used only for pasture that was plowed in last 7 years and other pasture in farms with exception of woodland pastured.

<sup>4</sup> Estimates of pasture and range land outside farms are based largely on data from State and Federal land-owning and -managing agencies as to the use and cover of all public land and other land outside farms.



TABLE 39.—*Pasture land in farms, by regions, 1945*

Region	Plowable pasture <sup>1</sup>	Nonplow- able non- forested pasture <sup>2</sup>	Total non- forested pasture <sup>3</sup>	Wood- land pasture <sup>3</sup>	Total farm land pastured <sup>3</sup>
	<i>1,000 acres</i>	<i>1,000 acres</i>	<i>1,000 acres</i>	<i>1,000 acres</i>	<i>1,000 acres</i>
Northeast.....	5,288	6,149	11,437	5,001	16,438
Lake States.....	8,697	6,262	14,959	9,308	24,267
Corn Belt.....	20,256	17,432	37,688	11,569	49,257
Appalachian.....	16,543	6,362	22,905	6,011	28,916
Southeast.....	5,895	5,230	11,125	11,938	23,063
Mississippi Delta.....	5,553	5,194	10,747	7,340	18,087
Northern Plains.....	16,584	60,997	77,581	1,337	78,918
Southern Plains.....	12,764	94,820	107,584	20,170	127,754
Mountain.....	12,803	182,336	195,139	14,426	209,565
Pacific.....	4,080	35,221	39,301	7,975	47,276
United States....	108,463	420,003	528,466	95,075	623,541

<sup>1</sup> Based on Production Adjustments in Agriculture, 1946 (39). Includes 35,930,000 acres of rotation pasture and 72,533,000 acres of other plowable pasture. Latter total was distributed by States in proportion to average other plowable pasture acreage for each State during 1935-39. Minor adjustments made for Arizona, Florida, Georgia, Michigan, Minnesota, Texas, and Wisconsin.

<sup>2</sup> "Cropland used only for pasture" plus "other land pastured" from the Census of Agriculture, 1945 (34) minus "plowable pasture" as established above.

<sup>3</sup> Data from Census of Agriculture, 1945 (34).

TABLE 40.—*Estimated special use areas, by States, 1945*

State	Total	Military lands <sup>1</sup>	Rural highways and roads <sup>2</sup>	Parks <sup>3</sup>	Urban lands <sup>4</sup>	Farmsteads <sup>5</sup>	Game refuges <sup>6</sup>	Rural railroad r. o. w. <sup>7</sup>	Other service <sup>8</sup>
	1,000 acres	1,000 acres	1,000 acres	1,000 acres	1,000 acres	1,000 acres	1,000 acres	1,000 acres	1,000 acres
Alabama	1,286	231	319	28	212	235	1	65	195
Arizona	7,132	5,080	203	1,455	44	39	0	51	260
Arkansas	1,186	275	254	21	152	242	116	63	63
California	10,148	2,385	901	4,674	1,463	347	32	130	216
Colorado	2,261	745	585	518	106	143	3	82	79
Connecticut	417	0	86	16	260	33	0	11	11
Delaware	98	16	20	0	23	14	14	3	8
District of Columbia	939	0	0	0	39	0	0	0	0
Florida	2,078	837	295	44	513	92	87	72	138
Georgia	2,154	567	424	48	362	210	366	95	82
Idaho	692	82	198	76	61	124	11	43	97
Illinois	2,509	170	803	25	729	493	10	173	106
Indiana	1,571	243	378	38	339	401	0	81	91
Iowa	2,055	60	769	19	413	522	27	127	118
Kansas	2,038	149	987	34	186	424	0	128	130
Kentucky	1,441	302	309	75	169	335	48	335	155
Louisiana	1,334	369	117	7	339	157	225	62	58
Maine	546	11	141	160	97	63	22	24	28
Maryland	472	122	72	20	136	62	10	15	35
Massachusetts	733	31	130	18	456	56	3	16	23
Michigan	2,443	45	769	286	653	418	79	84	109
Minnesota	2,615	233	974	79	454	472	116	125	162
Mississippi	1,214	295	262	22	158	300	42	57	78
Missouri	1,934	268	538	55	350	496	20	100	107
Montana	2,806	713	510	1,144	49	113	90	108	79
Nebraska	1,774	131	825	9	140	335	127	99	108
Nevada	6,354	3,628	224	127	27	10	2,240	46	52
New Hampshire	219	5	74	36	61	22	0	11	10

See footnotes at end of table.

TABLE 40.—*Estimated special use areas, by States, 1945*—Continued

State	Total	Military lands <sup>1</sup>	Rural highways and roads <sup>2</sup>	Parks <sup>3</sup>	Urban lands <sup>4</sup>	Farmsteads <sup>5</sup>	Game refuges <sup>6</sup>	Rural railroad r. o. w. <sup>7</sup>	Other service <sup>8</sup>
	1,000 acres	1,000 acres	1,000 acres	1,000 acres	1,000 acres	1,000 acres	1,000 acres	1,000 acres	1,000 acres
New Jersey	1,036	73	91	20	763	39	2	22	26
New Mexico	3,075	2,060	268	234	117	89	76	65	166
New York	4,419	174	377	2,368	1,084	224	6	96	90
North Carolina	1,773	292	432	2,269	341	215	72	60	92
North Dakota	1,752	1	984	75	44	209	157	97	185
Ohio	1,960	90	411	20	820	422	0	98	99
Oklahoma	1,683	256	482	35	190	399	77	102	142
Oregon	1,357	308	298	216	146	149	126	46	68
Pennsylvania	2,066	77	505	106	913	258	0	131	76
Rhode Island	141	6	20	7	97	5	0	2	4
South Carolina	973	198	242	41	192	118	85	50	47
South Dakota	1,996	322	848	286	65	206	32	72	165
Tennessee	1,733	124	279	358	231	305	3	48	385
Texas	4,241	773	886	735	733	526	55	265	268
Utah	2,886	2,030	145	285	195	59	63	49	60
Vermont	164	14	53	7	46	23	3	10	8
Virginia	1,386	284	310	277	211	177	14	60	53
Washington	2,469	454	223	1,180	248	135	60	79	90
West Virginia	530	27	173	38	144	83	0	46	19
Wisconsin	1,972	104	717	15	406	440	105	91	94
Wyoming	2,871	102	227	2,317	35	39	32	61	58
United States	100,032	24,762	19,138	17,923	15,012	10,278	4,657	3,469	4,793



acreage of rural villages and built-up areas is now included in other major land use areas, such as forest, grazing, farm, and other land. Separation would call for revision of accepted major land use areas of many counties and States. Accordingly, the area of rural villages, etc., is not included in total urban area of 15 million acres.

<sup>6</sup> Estimates based on farm and land use surveys made by State agricultural agencies and the Bureau of Agricultural Economics, and data on other land in farms obtained by the Census.

<sup>8</sup> Game refuges administered by the Fish and Wildlife Service given in Federal Rural Lands (20). (Areas of all State-owned wildlife areas and game refuges not available as of Jan. 1948.)

<sup>7</sup> From tabulation by Interstate Commerce Commission, January 14, 1947.

<sup>8</sup> Includes estimates as follows: Farm roads and lanes, 2,150,000 acres; airports, 1,278,000 acres; and "other" service, 1,365,000 acres.

<sup>9</sup> Approximately 1,000 acres of land classified as cropland by Census of Agriculture is included in urban area of District of Columbia.

<sup>1</sup> Military lands from Federal Rural Lands (20), minus estimated area of military airports.

<sup>2</sup> Estimates prepared from highway and road mileage and widths supplied by U. S. Bureau of Public Roads and State highway departments.

<sup>3</sup> National parks from Federal Rural Lands (20), and State parks from State Parks and Related Recreational Areas (47).

<sup>4</sup> Measurements and estimates of areas occupied by towns and cities having 1,000 population and over prepared from maps, census, and other data on areas and population. Urban areas, as here used, comprise land occupied by cities and towns of 1,000 population or more. For incorporated places, 2,500 population or over, the land area within corporate limits, as reported by the census, is used; for all other incorporated and unincorporated places, the area represents measurements on maps of built-up areas occupied by buildings, streets, lots, parks, and other service areas. An additional 9.8 million acres are taken up by rural villages and towns, with population of 100 to 1,000. They include school and other institutional sites and manufacturing plants and industrial areas. Estimated

TABLE 41.—*Estimated "service" areas, by regions, 1945*

Region	Total	Military lands <sup>1</sup>	Rural high-ways and roads <sup>2</sup>	Parks <sup>3</sup>	Urban lands <sup>4</sup>	Farm-steads <sup>5</sup>	Game refugees <sup>6</sup>	Rural rail-road r. o. w. <sup>7</sup>	Other service <sup>8</sup>
	1,000 acres	1,000 acres	1,000 acres	1,000 acres	1,000 acres	1,000 acres	1,000 acres	1,000 acres	1,000 acres
Northeast-----	9,741	391	1,477	2,738	3,777	723	36	323	276
Lake States-----	7,030	382	2,460	380	1,513	1,330	300	300	365
Corn Belt-----	10,029	831	2,899	157	2,651	2,334	57	579	521
Appalachian-----	7,472	1,167	1,595	1,037	1,294	1,191	161	280	747
Southeast-----	6,491	1,833	1,280	161	1,279	655	539	282	462
Mississippi Delta-----	3,734	939	633	50	649	699	383	182	199
Northern Plains-----	7,560	603	3,644	404	435	1,174	316	396	588
Southern Plains-----	5,924	1,029	1,368	770	923	925	132	367	410
Mountain-----	28,077	14,440	2,360	6,156	634	616	2,515	505	851
Pacific-----	13,974	3,147	1,422	6,070	1,857	631	218	255	374
United States-----	100,032	24,762	19,138	17,923	9 15,012	10,278	4,657	3,469	4,793

<sup>1</sup> Military lands are from Federal Rural Lands (20) Bureau of Agricultural Economics, minus estimated area of military airports.

<sup>2</sup> Unpublished tabulation based on road mileages and widths supplied by the U. S. Public Roads Administration and the State Highway Departments of the various States.

<sup>3</sup> National Park Service lands from Federal Rural Lands (20) State park lands from unpublished tabulation of Soil Conservation Service, 1941.

<sup>4</sup> Estimated area of places having population of 1,000 and over in all States.

<sup>5</sup> Estimated.

<sup>6</sup> Federal lands administered by Fish and Wildlife Service.

<sup>7</sup> From tabulation by Interstate Commerce Commission, January 14, 1947.

<sup>8</sup> Includes estimates as follows: Farm roads and lanes, 2,150,000 acres; airports, 1,278,000 acres; and "other" service, 1,365,000 acres.

<sup>9</sup> Approximately 1,000 acres of land classified as cropland by the Census of Agriculture is included in urban area of District of Columbia.

TABLE 42.—*Selected land use items and groupings of items, land in farms, by regions, 1945*<sup>1</sup>

Region	Cropland used only for pasture <sup>1</sup>	Total farm woodland <sup>1</sup>	Other land in farms <sup>2</sup>	Total land in farms <sup>1</sup>
	<i>1,000 acres</i>	<i>1,000 acres</i>	<i>1,000 acres</i>	<i>1,000 acres</i>
Northeast.....	1,822	14,165	3,026	48,903
Lake States.....	4,893	13,278	5,619	75,147
Corn Belt.....	11,362	16,624	8,115	143,289
Appalachian.....	8,760	30,157	4,066	86,335
Southeast.....	2,439	28,913	2,277	66,849
Mississippi Delta.....	3,532	15,377	2,329	47,113
Northern Plains.....	3,181	1,945	8,559	180,375
Southern Plains.....	6,379	21,387	3,084	177,500
Mountain.....	1,880	14,861	4,098	244,576
Pacific.....	3,201	9,629	2,395	71,528
United States.....	47,449	166,336	43,568	1,141,615

<sup>1</sup> Data from U. S. Census of Agriculture, 1945.<sup>2</sup> Estimated area included in: Farm roads and lanes; farmsteads; and rural public highways and roads, and rural railroad rights-of-way included within farm boundaries; and area of swamp, rock, waste, etc., having slight agricultural-use value except for recreation and wildlife protection. Residual items.TABLE 43.—*Land not in farms, by regions, 1945*

Region	Total <sup>1</sup>	Non- forested pasture and range <sup>2</sup>	Forest land <sup>3</sup>	"Other" land		
				Total	Special use areas <sup>4</sup>	Land having low agricul- tural value <sup>5</sup>
	<i>1,000 acres</i>	<i>1,000 acres</i>	<i>1,000 acres</i>	<i>1,000 acres</i>	<i>1,000 acres</i>	<i>1,000 acres</i>
Northeast.....	55,866	0	44,525	11,341	7,637	3,704
Lake States.....	47,571	0	41,182	6,389	3,868	2,521
Corn Belt.....	22,170	0	12,330	9,840	3,729	6,111
Appalachian.....	46,227	0	36,610	9,617	4,242	5,375
Southeast.....	57,601	0	44,081	13,520	4,628	8,892
Mississippi Delta.....	45,893	0	36,027	9,866	2,168	7,698
Northern Plains.....	15,053	7,894	2,150	5,009	2,906	2,103
Southern Plains.....	35,573	3,880	24,931	6,762	3,035	3,727
Mountain.....	304,438	145,983	106,628	51,827	26,097	25,730
Pacific.....	133,355	20,724	86,917	25,714	12,664	13,050
United States.....	763,747	178,481	435,381	149,885	70,974	78,911

<sup>1</sup> Data from U. S. Census of Agriculture, 1945 (34).<sup>2</sup> Estimated.<sup>3</sup> Estimated available nonfarm forest land outside of parks, preserves, military reservations, etc. Includes about 250 million acres grazed.<sup>4</sup> Includes estimated acreages in parks, game refuges, military lands, airports, rural public highways, and roads outside farm boundaries and rural railroad rights-of-way outside farm boundaries.<sup>5</sup> Includes estimated total area of marshes, sand dunes, rock, desert, and similar areas having limited surface-use value except for wildlife and watershed protection and recreation.



TABLE 44.—*Pasture and grazing land (including forest land grazed), by regions, 1945*

Region	Total pas- ture and grazing land	Nonforested pasture and grazing land			Forest land grazed		
		Total	Farm	Nonfarm	Total	Farm	Nonfarm
	<i>1,000 acres</i>	<i>1,000 acres</i>	<i>1,000 acres</i>	<i>1,000 acres</i>	<i>1,000 acres</i>	<i>1,000 acres</i>	<i>1,000 acres</i>
Northeast-----	20,438	11,437	11,437	0	9,001	5,001	4,000
Lake States-----	30,267	14,959	14,959	0	15,308	9,308	6,000
Corn Belt-----	55,257	37,688	37,688	0	17,569	11,569	6,000
Appalachian-----	62,496	22,905	22,905	0	39,591	6,011	33,580
Southeast-----	64,744	11,125	11,125	0	53,619	11,938	41,681
Mississippi Delta-----	53,826	10,747	10,747	0	43,079	7,340	35,739
Northern Plains-----	88,812	85,475	77,581	7,894	3,337	1,337	2,000
Southern Plains-----	153,834	111,464	107,584	3,880	42,370	20,170	22,200
Mountain-----	425,773	341,122	195,139	145,983	84,651	14,426	70,225
Pacific-----	96,500	60,025	39,301	20,724	36,475	7,975	28,500
United States-----	1,051,947	706,947	528,466	178,481	345,000	95,075	249,925

## SUMMARY TABLE

TABLE 45.—*Major uses of land in the United States, 1945*

Land-use items <sup>1</sup>	Acreage	Percentage of total
Cropland:	<i>Mil. acres</i>	<i>Percent</i>
Cropland harvested (1944).....	353	-----
Crop failure.....	10	-----
Idle or fallow cropland.....	40	-----
Cropland used only for pasture (rotation pasture).....	48	-----
Total.....	451	23. 7
Grazing land (open or nonforested) <sup>2</sup> :		
Plowable pasture in farms (in addition to cropland used for pasture).....	61	-----
Other open pasture in farms.....	420	-----
Grazing land outside of farms.....	178	-----
Total.....	659	34. 6
Forest land <sup>3</sup> :		
Farm woodland:		
Farm woodland pasture.....	95	-----
Farm woodland not pastured.....	71	-----
Nonforested land:		
Forest grazed.....	250	-----
Forest not grazed.....	186	-----
Total.....	602	31. 6
Special use areas, such as urban centers and towns, highways, roads, railways, parks, reservoirs, wildlife refuges, military land, etc., but excluding farmsteads and roads in farms <sup>4</sup> .....	71	3. 7
All other land, ungrazed desert, open swamp, rock, sand, and other land of low surface value, outside farms <sup>5</sup> .....	78	4. 1
Farmsteads, roads, lanes, and other land in farms <sup>6</sup> .....	44	2. 3
Total.....	1, 905	100. 0

<sup>1</sup> Revised data on major land uses for fig. 1.

<sup>2</sup> Open or nonforested grazing land exclusive of cropland used only for pasture and grazing land in parks, wildlife areas, etc. If the 48 million acres of cropland used only for pasture, listed above under cropland, is included here the total open grazing area is 707 million acres.

<sup>3</sup> The total acreage of forest land as given in the U. S. Forest Service Reappraisal Report, Basic Forest Statistics, (41) published January 1947, is 624 million acres. If 22 million acres in forested areas in parks, recreation areas, wildlife refuges, military camps, and some areas included in the open pasture area, etc., are excluded, the acreage available for timber is about 602 million acres. About 345 million acres of the forest land are grazed.

<sup>4</sup> Revised data on land areas occupied by urban centers, parks, highways, roads and railways, military lands, and other service areas include 29 million acres in farmsteads, roads, and lanes included in total farm area, making a total of 100 million acres in urban and special-use areas.

<sup>5</sup> All other land or other land of low surface value outside farms is estimated at 78 million acres. Other land in farms is 15 million acres, making a total of 93 million acres.

<sup>6</sup> Of the total 44 million acres, about 29 million acres are occupied by farmsteads, feedlots, gardens, roads, lanes, etc., in farms, and 15 million acres in other land.







